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TABLE OF CONTENTS

Thyroid Surgery, with a Contribution on Intrathoracic Goitre
GEOFFREY KEYNES, M.D., F.R.C.S. 621

Oral Hormonal Therapy for Menstrual Disorders G. I. M. SWYER, D.M., M.R.C.P. 626

Deficiency Patterns in Metallic Poisoning WILLIAM HUGHES, M.D., M.R.C.P. 634

Hospital and Domiciliary Control of Tuberculosis HARLEY STEVENS, M.R.C.P. 639

Coral Ulcer FRANK S. PRESTON, M.B. 642

Ferrous Sulphate Poisoning JAMES THOMSON, M.B., F.R.C.P.Ed. 645

Liver Fluke in Common Bile Duct
F. D. MURPHY, F.R.C.S., and K. G. PASCALL, F.R.C.S.Ed. 647

MEDICAL MEMORANDA

Synchronous Double Primary Carcinomata. T. B. WILLIAMSON, M.B., B.S. ..648
Case of Polyneuritis after Mumps. VIVIAN USBORNE, M.R.C.P., D.C.H. 648
Parotid Cysts. H. D. MOORE, F.R.C.S. ..649

REFRESHER COURSE

Post-partum Haemorrhage. G. W. THEOBALD, M.D., M.R.C.P., F.R.C.S.Ed., F.I.C.S., F.R.C.O.G. 659

GENERAL ARTICLES AND NEWS

The Teaching Hospital and the General Practitioner. LESLIE COLE, M.D., F.R.C.P. 661
The Family Doctor in the N.H.S. GEORGE MACFEAT, O.B.E., M.B. 663
Bill of Health 664
Prevention of Welders' Flash. R. M. DICKSON, M.D. 667
REPORTS OF SOCIETIES 667
MEDICAL NOTES IN PARLIAMENT 675
UNIVERSITIES AND COLLEGES 676
THE SERVICES 677
EPIDEMIOLOGY SECTION 677
MEDICAL NEWS 678
BIRTHS, MARRIAGES, AND DEATHS 680
QUESTIONS AND COMMENTS 681

REVIEWS

Psychiatry for Physicians 650
Textbook of Ophthalmology 650
Sixty Years of London's Health 651
The Middlesex 651
Amino-acids and Proteins 651
Dermatology 652
Books Received 652

LEADING ARTICLES

The General Practitioner in the Hospital 653
Iodine and Goitre 654
Hormonal Treatment of Anovulation ..655
Cost of N.H.S. 656

ANNOTATIONS

Vitamin Deficiencies in Metallic Poisoning 657
Agenized Flour 657
Arsenic in Food 657
Peptic Ulcer and Environment 658
Epistaxis and Vitamins 658

OBITUARY

William P. S. Branson, C.B.E., M.D., F.R.C.P. 674
J. A. Ryle, M.D., F.R.C.P. 675
R. E. M. Taunton, M.B. 675

SUPPLEMENT

118th Annual Meeting: Provisional Programme 83
Health Service.—EXCHANGE OF PRACTICES —REGIONAL PSYCHIATRISTS—INDUSTRIAL HEALTH SERVICE — AFTERCARE — MAXIMUM NUMBER ON LISTS 83
HEARD AT HEADQUARTERS 84
MEDICAL DEFENCE FOR OVERSEAS MEMBERS 84
MEDICAL ASSOCIATION OF EIRE 90
G.M.S. SUBCOMMITTEE (SCOTLAND) 91
PUBLIC HEALTH SERVICE DEFENCE TRUST FORMED 91
OCCUPATIONAL HEALTH SERVICES 92
GENERAL PRACTITIONERS' REMUNERATION ..93
B.M.A. FILM LIBRARY 94

CORRESPONDENCE

Psoriasis and the Adaptation Syndrome. F. L. LYDON, M.B. 668
Radiological Diagnosis of Pneumoconiosis. A. I. G. MCLAUGHLIN, M.B. 668
Caudal Analgesia. T. CECIL GRAY, M.D., and R. MARCUS, F.R.C.S. 668
Wassermann and Kahn Reactions. J. F. HEGGIE, M.B., and R. M. HEGGIE, M.B.; FRANK MARSH, M.D. 669
Vitamin C and Benzene Poisoning. J. H. LURIE, L.M.S.S.A. 669
Pain Simulating Heart Disease. M. G. GOOD, M.D.; R. HALSTEAD DIXON, M.B. 670
Hypersomnia. E. R. BICKERSTAFF, M.D. 670
Brachial Plexus Block. D. C. DEVITT, M.R.C.S., and others 670
M.T. Malaria. G. M. EDINGTON, M.B. ..671
Side-effect of Proguanil Therapy. V. L. BILLINGTON, M.B. 671
50 Years of Medicine. G. M. CRABBE, M.B. 671
Microscopical Examination of Faeces. M. DYNSKI-KLEIN, M.D. 671
Night Cramps and Quinine. LEONARD BOYS, M.B. 672
Erythema Nodosum. S. P. BARTFELD, M.D.; H. G. CALWELL, M.D. 672
An Unusual Murmur. C. UHMA, M.D. ..672
Gastric Surgery in the Last Half-century. A. P. BERTWISTLE, F.R.C.S.Ed.; E. MARCUS, M.D. 672
An Appendicular Faecolith. ERIC COLDREY, F.R.C.S. 673
Occupational Tumours of the Bladder. J. DEREK RICHARDSON 673
Sadism on the Screen. A. R. THORNTON; E. ELKAN, M.D. 673
Definition of Senility. FRED MESSER, C.B.E., M.P. 674

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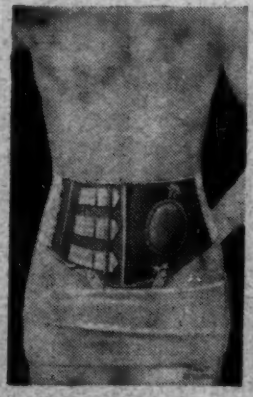

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BRITISH MEDICAL JOURNAL

LONDON SATURDAY MARCH 18 1950

THYROID SURGERY FIFTY YEARS AGO, WITH A CONTRIBUTION ON INTRATHORACIC GOITRE*

BY

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Your Dean has done me honour by inviting me to deliver the second lecture in memory of Thomas Percy Legg, formerly surgeon to this hospital. Legg belonged to a much earlier generation of students than I at St. Bartholomew's, and I do not remember that I ever was privileged to meet him—not even at Queen Square, though he examined there for many years. He was not a prolific writer, and I would say that he was not very well known in the outside world; but the foundation of this lecture is a testimony to the esteem in which he was held in his own hospital. He was in the truest sense one of that disappearing genus the general surgeon, and his range was wide, so that two of his main interests were subjects so diverse as cleft palate and the surgery of the thyroid gland. The former of these subjects was commemorated in the first Legg Memorial Lecture by Denis Browne in 1948. It now falls to my lot to consider the state of the thyroid surgery of his time, adding as a pendant a small contribution of my own.

Cheyne and Burghard's Manual

There was a textbook famous in its time, Cheyne and Burghard's *Manual of Surgical Treatment*, first published in 1902. Sir Watson Cheyne and F. F. Burghard were both at that time surgeons on the staff of this hospital, and as general surgeons were able to cover the whole field between them, and there is no indication of what parts either of them wrote. A new edition of this splendid book was published in 1913, but by then times were changing, and the authors called on the help of two younger surgeons, T. P. Legg and Arthur Edmunds, both assistant surgeons to this hospital, so that the book remained entirely a King's College product of which you, their successors, may be proud.

It has been my fate to be a member of several library committees, usually as chairman, and on a number of occasions I have had to resist suggestions that shelf-space might be created by clearing out old editions of textbooks, superseded, as it was supposed, by newer and better reprints. This attitude is not a new one, and is exemplified by the curators of the Bodleian Library at Oxford, who, when the second edition of Shakespeare's plays was published in 1632, sold their copy of the first folio of 1623 as out of date and useless. Their successors were sorry three centuries later when they had to pay several thousand pounds to get it back on to their shelves. With this warning before them, library committees should be very careful about discarding old editions, even though there should be ten editions of the same book.

Librarians are guardians of history, and a moment's thought will show that there could be no better way of surveying the history of the subject than by noting the changes in successive editions of a book, always supposing that the author strove to keep abreast of his subject. It is notorious that textbooks are apt to have a time-lag in the presentation of new material, but let us not in these surroundings accuse Cheyne and Burghard of this lapse. It is, in fact, instructive to compare the sections on thyroid surgery in the two editions of 1902 and 1913, the later one having been partly rewritten by Legg. In 1902 Kocher, of Berne, was the greatest European figure in thyroid surgery, and in this country James Berry was coming to the fore. His book on the thyroid was published in 1901. Berry, like Legg, had been trained at St. Bartholomew's, and both of them worked on the staff of the Royal Free Hospital, which, with Cecil Joll to carry on the work, has been ever since a centre of thyroid surgery.

Much of Cheyne and Burghard's section on the thyroid, though written fifty years ago, sounds surprisingly modern, for, after all, many of the fundamentals in any subject do not change. But there are some pleasant old-fashioned touches, as when you read that the treatment of suppurative thyroiditis is by the use of calomel, salicylate of soda, and leeches. Again, the sovereign remedy for simple goitre is stated to be iodine and iodides, whereas thyroid extract is said to be useless. Nowadays you would be told exactly the opposite. As an alternative it was thought worth while to record that "in India the red iodide of mercury ointment is rubbed in thoroughly over the goitre, and the neck is then exposed for some hours to the rays of a hot sun; it is stated that very great improvement has been obtained in this way, but unfortunately in this country the method is quite useless and is not worth while attempting." Perhaps this was included in anticipation of the summer of 1949, but it has borne no fruit. It would, anyway, be as good as using "iodex."

It is of interest to note that Kocher's transverse incision was then recommended as the best for thyroid operations, and it is not surprising that the anaesthesia was found to be the great difficulty and the chief danger to the patient's life. The skill and rapidity of the surgeons of those days in dealing with large goitres is implied in the light-hearted way in which the possibility of haemorrhage is mentioned, and in the statement that "about twelve ligatures" are all that need usually be applied. Modern operators may well hide their heads in shame. Even so, the inferior thyroid artery was not to be tied in continuity, but its branches were seized and tied in a bunch as they entered the gland. The

*The Legg Memorial Lecture delivered at King's College Hospital on December 2, 1949.

danger to the recurrent laryngeal nerve was, of course, fully realized (this nerve had been discovered and described by Galen in the second century A.D.), but the parathyroid glands were unknown and therefore not mentioned. As lately as about 1927 I asked Sir James Berry to look at a section of a parathyroid body. He put his eye to the microscope, snorted, and said he didn't believe it: that was indeed the end of the matter so far as he was concerned at that time, though he may have changed his mind before his death in 1946. In his book of 1901 he had just mentioned the parathyroids, and said of them, "They differ from the accessory thyroids in not containing vesicles filled with colloid, and their function is supposed by some to be different from that of the thyroid gland itself. A specimen showing the parathyroid of a dog may be seen in the museum of St. Thomas's Hospital." That was all. He did not refer to them in his contribution to Burghard's *System of Operative Surgery*, published in 1909.

Exophthalmic Goitre

Of exophthalmic goitre the writer in 1902 observed, "This is essentially a medical affection and comes under the care of the physician, but as attempts have been made of late to employ surgical treatment in these cases it may be as well to refer to it here." This cautious attitude was no doubt justified at that date. The anaesthetic and post-operative dangers were very great and the mortality extremely high. Berry had expressed the same view in 1901, and even in 1909 in Burghard's *System of Operative Surgery* he wrote: "It must be remembered that all operations for exophthalmic goitre involve serious risk to life and should seldom be recommended." This was the view of the most experienced thyroid surgeon of this day, and it was not, indeed, until Thomas Peel Dunhill arrived in London in 1920 that the whole subject underwent so radical a change.

In 1902 some attention was given to the operation of removal of the cervical sympathetic chain for exophthalmic goitre. I am informed by the President of the Royal College of Surgeons that it was Legg who revised the thyroid section in the 1913 edition of the *Manual of Surgical Treatment*. It was disappointing to find, on comparing the two editions, that there was very little change in a great part of the article. The leeches, the red iodide of mercury, and the twelve ligatures were still there. Thyroid extract was now said to be "sometimes extremely useful" in treating simple goitre. The value of "intratracheal insufflation" was mentioned in relation to the dangers of the anaesthetic, but the description of the operation of thyroidectomy was almost unchanged. A glance, however, at the pages on exophthalmic goitre was reassuring; they had been completely rewritten, and Legg had now run ahead of his friend and colleague, James Berry. "During the last few years," he wrote, "the surgical treatment of this affection has been undertaken with increasing frequency, and therefore it is necessary to discuss it in some detail."

The use of iodine in exophthalmic goitre was still completely misunderstood, and it is coupled with thyroid extract as contraindicated. On the other hand, the primary and secondary forms of toxic goitre are recognized, the operation of cervical sympathectomy is condemned, and, best of all, the value of ligation of the thyroid arteries and of partial thyroidectomy is fully recognized. In 1902 ligation of arteries was regarded as of no value; its importance as a preliminary stage and as a life-saving operation was not appreciated. In 1913 opinion had certainly gone too far the other way with the statement that "in early cases ligature of one or both superior thyroid arteries will often bring about a cure." Clearly the patients had not been observed over a long enough period, otherwise the inevitable relapse would have been seen.

The same lack of experience is shown in the description of the operation of partial thyroidectomy, where removal of one lobe only is advocated, though it is admitted that a second operation on the other lobe *may* be carried out at a later date. We know now that removal of one lobe is never adequate, though until the advent of thiouracil it was sometimes safer to do the operation in two stages. Legg was fully aware of the danger of haemorrhage in this operation and of the value of extra fluids after operation. He was in favour of using local rather than general anaesthesia, and was aware of the complications introduced by the cardiac disease which so often accompanied the goitre.

As examples of the way fashions in medical treatment come and go, there are Legg's cautious references to the treatment of exophthalmic goitre with the serum of thyroidectomized goats, and with vaccines of organisms of the colon group obtained from the faeces of the patient. It was, he said, "too early to speak definitely of the value of this treatment," though as a candidate for qualification in 1913 I had to recite these little pieces, particularly the one about the thyroidectomized goats.

Legg and Berry

I have already mentioned that Legg and Berry were colleagues at the Royal Free Hospital. Berry certainly achieved the greater reputation as a thyroid surgeon, though there are signs in their writings that Legg was possibly the more progressive. His judgment was perhaps also more balanced, as is suggested by his not mentioning in his article the preposterous operation known as "exothyropexy." This was described by Berry in his book of 1901, and again in 1909 in Burghard's *Operative Surgery*. This operation consisted in exposing the enlarged thyroid gland, whether simple or toxic, on the surface by dislocating both lobes through a long incision in the midline of the neck. The raw surface was then left to granulate and cicatrize. The superficial vessels tended to thrombose, and sometimes the gland shrank in size. The complications were numerous and serious—sepsis, haemorrhage, painful dysphagia, and asphyxia. This frightful and senseless procedure had its origin in France, and Berry observes that it was unlikely to become popular in this country—a testimony to the common sense of British surgeons. Why, then, did he think the operation worth describing at some length? Legg certainly did not, and he made no reference to it.

Intrathoracic Goitre

I have said that Legg made little change in 1913 in the account of the operation for non-toxic goitres. There was, however, one interesting addition—namely, a page of new matter dealing with intrathoracic goitre. A certain amount has been written on this subject since Legg's day, though his brief remarks contain the essentials of the matter.

The first difficulty that we encounter in treating of the subject is that of nomenclature. Legg wrote of "intrathoracic goitre"; Berry called it "substernal." Other writers have called it "mediastinal" or "aberrant mediastinal" goitre; yet others call it "plunging goitre" in reference to the mobility of some of these tumours, which may be sometimes in the neck, at others in the thorax. No doubt all these names have their justification, since there are so many different degrees of descent of the gland.

When the thyroid gland enlarges it can, in general, do so in only two directions. Anatomical limitations prevent its going backwards or to the sides; gravity and the base of the skull prevent its going far upwards. It can bulge

forwards by stretching the pretracheal muscles and skin, and sometimes becomes enormous in this way. More often, however, assisted by gravity, it enlarges downwards behind the mesial ends of the clavicles and the sterno-clavicular articulations, or it may pass the first rib and come to lie truly within the thorax. In this position the tumour is likely to be partly within the anterior mediastinum and so behind the upper part of the sternum. It may also enlarge the mediastinum by compression of the upper lobes of the lungs and so lie behind the upper two or three ribs.

There are therefore two main degrees of descent—retro-clavicular and intrathoracic—and it seems to me that these two terms will cover the great majority of goitres that are so commonly met with in these situations. Every thyroid surgeon of mature experience will have seen many of them, and will have noticed how often these extensions have been missed clinically, or sometimes, even at operation, by inexperienced operators. It is surprising how low down goitres may extend without causing pronounced symptoms, the wandering masses of thyroid tissue accommodating themselves to their surroundings. Frequently they reach the arch of the aorta or some distance below it. A specimen removed some years ago was mounted in a jar with the ribs and great vessels marked on the glass so as to show its relations (now in the museum of the Royal College of Surgeons).

The main symptom caused by intrathoracic goitres is dyspnoea, produced by displacement and compression of the trachea, particularly at the thoracic inlet. It is the effect on the trachea which makes the goitres usually quite easy to demonstrate on an *x*-ray film. The tumour itself may produce only a vague shadow, but the deformity of the trachea will be readily seen. Besides dyspnoea, other symptoms which may be seen are numerous. They include orthopnoea, alteration of the voice, and venous engorgement at the root of the neck and over the upper part of the chest. Dysphagia is very unusual with an innocent tumour, the oesophagus being a muscular organ able to look after itself. Paralysis of a recurrent laryngeal nerve with abductor paralysis, or of the sympathetic chain, does occur but is uncommon. Chronic bronchitis is a common complication. The differential diagnosis includes tumours of the thymus gland and aneurysm of the great vessels: here it is well to remember that thyroid tumours can be very vascular and may show pulsation on the *x*-ray screen. Usually the clue is given by the fact that clinical examination will detect that the lower limit of a goitre cannot be felt above the clavicle with the fingers, or that the upper pole of an intrathoracic tumour can be felt in the neck.

So much for the ordinary intrathoracic goitre. Another very rare variety has been described by American writers as " mediastinal aberrant goitre " (Rives, 1947). Very few, only sixteen in Europe and America over a period of ten years, have been described. The definition of such a tumour lays down that it shall be wholly intrathoracic and shall have no demonstrable connexion with the thyroid gland in the neck. There may be a vascular pedicle from above, since its blood supply will usually come from the neighbourhood of the inferior thyroid artery ; occasionally the blood supply may come from the subclavian artery or even the aorta. Tumours of this kind have been found behind the oesophagus or resting on the diaphragm. Transpleural operations may be necessary for their removal, but I have no personal experience of such problems.

Operative Treatment of Intrathoracic Goitre

The operative treatment of intrathoracic goitre is often not very difficult, but a considerable technical repertory may be needed. If an intrathoracic extension of a goitre has been diagnosed the surgeon must be prepared to open the mediastinum, as first demonstrated by Sir Thomas Dunhill in 1922. He found it necessary to do so for removal of a nodular goitre which extended below the bifurcation of the trachea. Almost always, however, the tumour can be removed through the neck. Should the tumour be retro-clavicular there will clearly be no great difficulty, as it can easily be dislocated upwards with the lobe of which it is a part. With an intrathoracic extension it may be difficult or impossible to introduce a finger beside the tumour and to reach its lower border, so that delivery of the tumour is prevented. If any force is used in order to effect this there is a danger of tearing a large vessel such as the subclavian or left innominate vein and of starting almost uncontrollable haemorrhage.

It has therefore always seemed to me better, in the face of real difficulty, to proceed with gentleness and guile. Attention is for the time being directed entirely to that part of the tumour which is accessible in the neck. Its vascular connexions above and behind are severed and controlled ; its connexions with the side of the larynx and trachea are separated ; the isthmus is sometimes divided. The whole of that lobe of the thyroid gland has now been detached from its surroundings in the neck. The lobe is then gently pulled upwards and the thoracic portion follows, usually without much resistance, though it sometimes can be assisted with a finger alongside. The intrathoracic goitre comes up, in fact, like a cork out of a bottle, though with considerably less difficulty.

It is always reassuring to remember that the only vascular connexions of an intrathoracic goitre are the inferior thyroid veins draining into the left innominate vein. These started at the root of the neck when the thyroid was still restricted to that area, and do not seem to shorten when the gland descends, so that there is little danger of tearing them unless undue violence is used. By employing the method described these veins can be clamped and tied at leisure after the delivery of the gland from the thorax.

Having performed a large number of operations of this kind, I have found that nearly all intrathoracic goitres can be dealt with in this way. Sir James Berry used to employ a dinner-spoon to assist in thyroid delivery from awkward corners, and I dare say Legg may have done so too ; but I would deprecate the use of any special or homely instrument for this purpose. Guile is better.

Some operators have advocated the evisceration of difficult intrathoracic thyroid tumours—or *morcellement*, to use an obstetrical term. This may occasionally have its uses, and certainly the evacuation of fluid from a cystic tumour should be done when possible ; but, in general, evisceration is a messy method, and since so many of the goitres are nodular, with separate masses hanging together by strands of connective tissue, part of the goitre may be left behind unless operative technique is clean and precise. Although intrathoracic masses sometimes grow larger in their lower part than they are at the waist corresponding to the thoracic inlet, they can nevertheless be gently coaxed out of their retreats.

Serious Problems

Having thus minimized the operative terrors of intrathoracic goitres in general, I now wish to emphasize them by drawing attention to more serious problems with which the thyroid surgeon may occasionally be confronted. There is always danger lurking in the acquirement of fixed habits of mind. Thus a thoracic surgeon who assumes that all intrathoracic tumours can be suitably removed through

a transpleural approach may be for a few moments dismayed when he finds that a tumour supposed to be of thoracic origin has its main vascular connexions some way up in the neck. He must then hurriedly try to recollect what he once knew years before about the anatomy of the neck and attack his problem through another incision a long way from where he started. In the same way I have long maintained that any general surgeon who aspires to be an exponent of the surgery of that endocrine triad the thyroid, the parathyroid, and the thymus must be prepared to extend his range, when called upon, into the mediastinum, or even the pleura and pericardium. The thyroid and the parathyroid may, and the thymus must, make this demand. I am speaking to-day only of the thyroid, and I may give an example.

Case 1

A female patient aged 21 had had a nodular goitre, to her knowledge, for seven years. The trachea was displaced to the right in the neck, and there were engorged veins over the upper part of her chest; these facts suggested that there might be an intrathoracic goitre, but she had no embarrassment of breathing. She had a persistent tachycardia of 80–120 in bed, but no other obvious signs of toxic complications. *X*-ray photographs showed that there was indeed a large mass in the mediastinum with displacement of the trachea to the right and backwards. Moreover, the presumably thyroid tumour showed many areas of calcification, which was surprising in a patient so young.

At operation through the ordinary collar incision in the neck the left lobe of the thyroid was found to be very large, extending upwards behind the pharynx to the base of the skull. When this upper part had been detached it was found that its connexion with the lower part in the mediastinum had been lost, the nodule formation having resulted in the development of more or less separate masses. A finger exploring from above could detect a mass in the left side of the thorax; but this mass was quite fixed, and it became clear that the ordinary means of delivery could not be used. The mediastinum was accordingly opened by splitting the sternum down the centre to the level of the third rib, the two halves of the bone being freed by cutting it sideways into each second intercostal space, according to Dunhill's method. It was now found that the massive calcified goitre was densely adherent to the back of the sternum and the structures behind it in the mediastinum. The transsternal exposure made it possible to remove safely the whole mass, detaching it successively from the sternum, the pleura on each side, the trachea, and the left innominate vein. The tissue removed weighed almost 300 g.; the recurrent laryngeal nerves escaped injury. The thymus gland was removed at the same time, a normal gland being in demand for the biochemists. The patient was quite well when seen two months later.

Goitre in the Posterior Mediastinum

The history just described was that of an ordinary intrathoracic goitre which had undergone unusual pathological changes. The next problem I wish to describe is that of intrathoracic goitres which have enlarged in an unusual direction. The great majority of these descend, as they grow, into the anterior mediastinum immediately behind the sternum and inner ends of the ribs. Occasionally, however, they choose to enlarge downwards and backwards, so reaching the posterior mediastinum on one or other side behind the trachea and the upper lobe of the lung. It is not so very uncommon for parathyroid tissue to reach this area, and it is one of the places where a tumour of the gland must be sought if it cannot be found in the neck. A branch of the inferior thyroid artery proceeding downwards and backwards has been described as providing a guide to the position of the tumour. Parathyroid tumours are comparatively small and may be fished up from the posterior mediastinum with a finger. Thyroid tumours, on the other hand, tend to get very large, and can by no means be removed so easily. I have recently seen two patients presenting this particular problem.

Case 2

A woman aged 55 with a history that since 1941 her breathing had tended to be noisy had had occasional attacks of bronchitis. Recently she had two attacks of paroxysmal tachycardia with pain in the chest. She was slightly short of breath, especially when talking, but had not noticed any change in her voice, and was able to lie flat in bed. She had not, in fact, sought medical aid, but when taking part in a "mass radiography" at University College Hospital she was found to have a large pear-shaped shadow in the upper part of the right posterior mediastinum, *behind* the trachea, which was displaced with the oesophagus and aortic arch to the left.

She was a healthy-looking person with a pulse of 78, B.P 145/90. The trachea was deviated to the left in the neck, but no neck swelling could be seen. A tumour could just be detected by deep pressure behind the right clavicle, and there was a loud respiratory stridor on auscultation of this region. The patient showed no clinical evidence of thyrotoxicosis, although she was mentally very unstable. The diagnosis of intrathoracic goitre was made because it was believed that the tumour had its upper connexions at the root of the neck, but it was evident at once that this very large mass could not be removed by operating simply from the neck, as it would be quite inaccessible.

The operation was therefore planned as a mediastinal exploration. The sternum was split to the third rib, and when this had been done it was possible to find a vascular pedicle at the root of the neck leading down to a thyroid mass which lay in the right posterior mediastinum behind the right innominate vein. The opening up of the thoracic inlet made it possible to displace the vessels forwards and then to pull the tumour up from behind them. It would have been quite impossible to do this without the sternal split. The alternative would have been a transpleural thoracotomy, but then it would have been difficult to reach the vascular pedicle. As it was, the removal was effected without great difficulty and the patient made a good recovery.

Case 3

A woman aged 55 had complained of some shortness of breath for ten years, getting worse in the last two years. She also had an irritating cough, substernal pain, and some dysphagia. She had no toxic signs or symptoms.

X-ray films (Fig. 1) showed a rounded mass occupying the midline of the thorax and projecting to the right of the vertebral

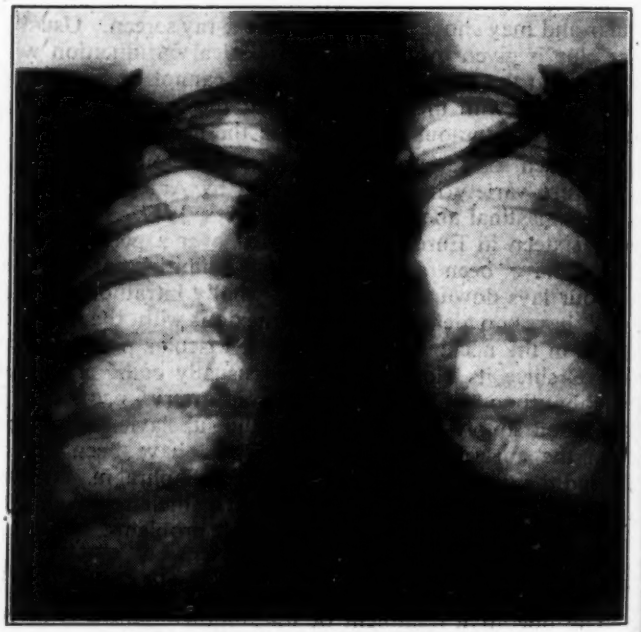

FIG. 1.—Case 3. Antero-posterior view.

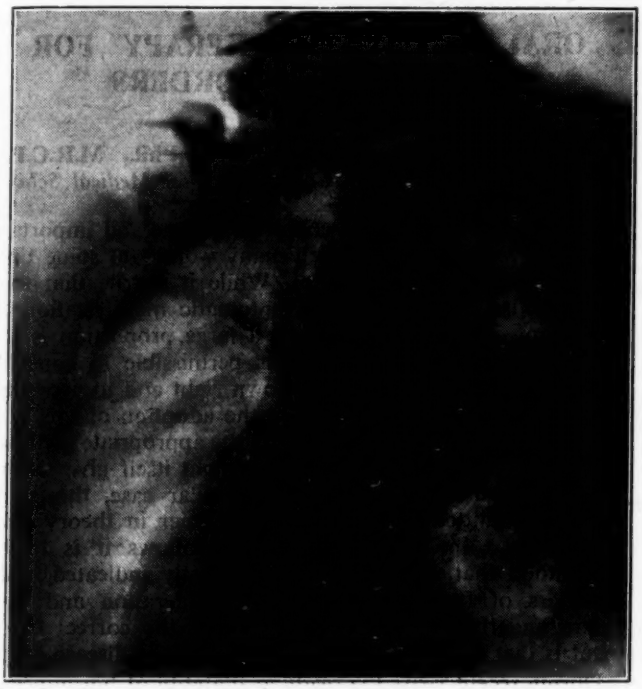

FIG. 2.—Case 3. Posterior mediastinal goitre, showing the trachea in front; lateral view.

column. The lateral view (Fig. 2) was more startling because of the extreme displacement of the trachea, which was pushed far forward by the tumour and was curved over it. On the screen the tumour appeared to pulsate, and the radiologist regarded this as suggesting an aneurysm of the arch of the aorta. However, a thyroid enlargement could be detected on the left side of the neck, and the tumour was diagnosed as an intrathoracic goitre. Exploration of the neck confirmed the presence of a thyroid tumour in the chest, but it was so fixed that clearly the mediastinum had to be opened for its removal. The sternum was accordingly split to the third intercostal space. It was then found that the neck of the tumour was behind the left innominate vein, which was stretched tightly over it. With the freedom gained by the mediastinotomy it was possible to coax the tumour up from behind the great venous trunk. Again it would have been impossible without this extra freedom. The tumour weighed 290 g., and had the structure of an adenoma of the thyroid.

I have described these two operations on goitres in the posterior mediastinum because this variety of intrathoracic goitre has received hitherto little attention. Only seven examples have been described in the literature of the world, and the information given suggests that none of them was comparable to the two enormous tumours which I happen to have encountered. Indeed, the seventh, described by Mora *et al.* in 1944, weighed only 21 g. after removal, and the *x*-ray film taken after operation, which is reproduced in their article, suggests that part of the tumour was still present in the thorax. Cecil Joll (1932) does not mention posterior mediastinal goitre in his book, the most comprehensive work on thyroid surgery ever written. Also it is evident from his remarks that he had never in all his immense experience found it necessary to divide the sternum, and I can only conclude that he had never seen a goitre in this peculiar position.

The last patient that I wish to describe was of a somewhat different type.

Case 4

A woman of 48 had recently complained of shortness of breath and loss of weight. She had attended in 1942 at a London hospital and her thorax had been *x*-rayed. An enormous shadow was seen in the upper part of the chest, and a diagnosis of mediastinal sarcoma was made. She was then transferred to St. Bartholomew's for treatment by million-volt *x*-ray therapy, and was admitted under Dr. Scowen. The diagnosis, however, was questioned, and the patient was discharged, without treatment, for further observation. This did not please the authorities at the first hospital, and she was again sent to St. Bartholomew's, but this time direct to the Radiotherapeutic Department for treatment as an out-patient. A few treatments were given, but the patient became so much worse that she had to be readmitted to hospital under Dr. Scowen. He had suspected the presence of a thyroid tumour before, owing to the very definite outline of the shadow, but this time he was sure, because the patient now presented undoubted signs of severe thyrotoxicosis. She was then transferred to the New End Thyroid Clinic for operation. The *x*-ray appearance of the chest was sufficiently alarming, since the tumour filled the whole of the anterior mediastinum, extending well down on to the pericardium (Fig. 3). It was obvious that a mediastinotomy was absolutely necessary if the tumour was to be removed, since no thyroid gland could be felt in the neck at all—a fact which probably accounted for the original wrong diagnosis.

The operation was done on May 23, 1942, and proved to be the most terrifying surgical experience of my career. A low collar incision had to be carried through a number of very large distended veins at the root of the neck. No thyroid tissue at all could be found on the right side. There was an apparently normal lobe on the left. The sternum was then split as far as the fourth intercostal space, and when the doors of the mediastinum were opened there lay exposed to our view an enormous plum-coloured tumour with blood pouring from every part of its surface. At first it appeared that if I proceeded the patient would die of haemorrhage on the table, but I derived confidence from the thought that a thyroid tumour could have no major sources of blood supply in the thorax.

The tumour was gradually separated from its surroundings by working first on one side and then on the other, packing off the separated surfaces bit by bit with gauze. Eventually I isolated a very large vascular pedicle which turned down from the right thyroid axis, and when this had been divided the tumour had no further connexions above. It could then be

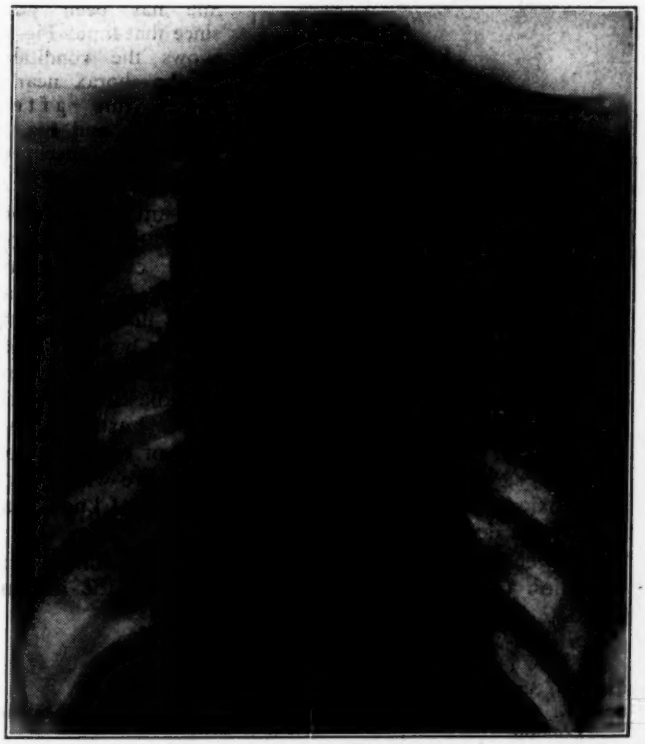

FIG. 3.—Case 4. Aberrant intrathoracic toxic goitre; antero-posterior view.

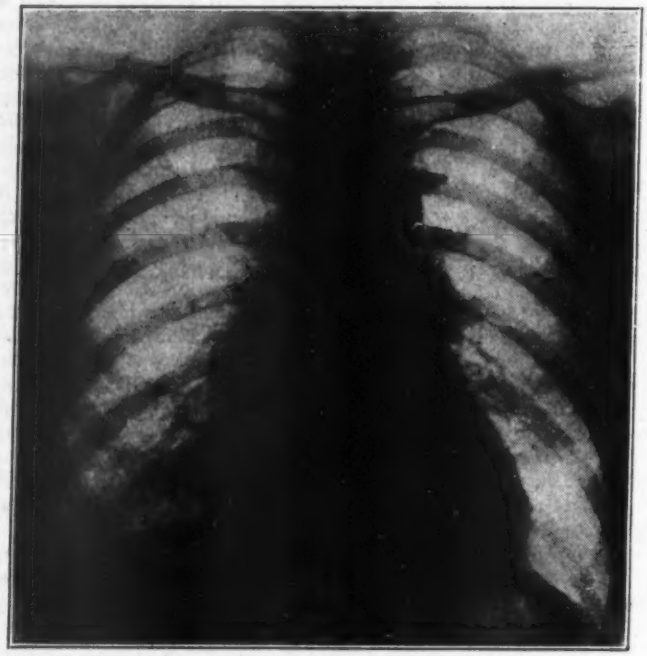

FIG. 4.—Case 4. Thorax after removal of aberrant intrathoracic toxic goitre.

lifted out of the thorax and removed after two venous channels below had been divided. These appeared to pierce the pericardium to empty direct into the auricle. The patient was given a blood transfusion at the conclusion of the operation and, as might be expected, had a severe thyrotoxic reaction during the days following. Her convalescence was complicated by collapse of the lower lobe of the left lung, but she eventually made a good recovery with disappearance of all signs of thyrotoxicosis. She has been well since that time. Fig. 4 shows the condition of the thorax nearly three years after operation, and Fig. 5 depicts the specimen removed.

FIG. 5.—Case 4. The specimen removed, showing vascular pedicle. Weight, 354.5 g.

I am putting forward the claim on the evidence of these four operations that mediastinotomy has a definite place in the surgery of goitre. I have also described a form of intrathoracic goitre in the posterior mediastinum which has seldom been recognized or described. Lastly, I have shared with you the alarming experience of operating on a true, very large, aberrant intrathoracic goitre with severe thyrotoxicosis, an association which, so far as I know, has never been described.

[The lecture was illustrated with a coloured film of the operation of mediastinotomy for removal of the thymus gland.]

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ORAL HORMONAL THERAPY FOR MENSTRUAL DISORDERS

BY

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Disorders of menstruation comprise a large and important group of conditions for which many women at some time or other seek medical advice. While it is true that they are essentially the outward symptomatic manifestation of underlying disturbances, in such a large proportion is the condition dysfunctional that it is permissible to consider them as disease entities in their own right and to prescribe treatment on that basis. Clearly the adoption of this attitude presupposes the elimination by the appropriate methods of systemic or local disease which might itself give rise to the menstrual disorder in any particular case, though it must be admitted that this is often easier in theory than in practice. In the account which follows it is to be understood that, except where specifically indicated, only disorders of function are under consideration and that where underlying organic disease exists the correct treatment is that directed towards the cure of the disease itself.

During recent years the ready availability of hormones—particularly the steroid hormones and their synthetic analogues—has led to their increasing use in the treatment of menstrual disorders, and the fact that oestrogens, androgens, progestogens, and gonadotrophins have all had their enthusiastic advocates would suggest strongly that empiricism has played an altogether excessive part in determining such therapy. It is not, however, the purpose of this communication to discuss the relative merits of the various techniques that have been proposed; on the contrary, attention will be directed solely towards a therapeutic regime based upon that originally described by Hamblen (1945) and involving the oral administration of oestrogens and progestogen. This method has a rational basis (which may, of course, be founded upon partially false premises) and, in addition, has the great practical advantage of avoiding parenteral therapy, inconvenient to doctor and patient alike.

The results of treatment of 52 patients complaining of menstrual disorders form the basis of the following report. These cases, treated in the Endocrine and Fertility Clinics at University College Hospital, have been selected solely on the grounds of the treatment having extended over a sufficient length of time and of adequate follow-up. They are conveniently grouped into cases of prolonged and excessive bleeding with irregular cycles (19) and with regular cycles (7); cases of irregular (chiefly scanty and infrequent) and anovular but otherwise regular cycles (13); and cases of secondary amenorrhoea (13). The plan followed consists, first, of a detailed description, along somewhat dogmatic lines, of the methods of treatment that have been adopted, and, secondly, of a critical evaluation of the results achieved. It is my intention to present only what I have myself found to be the case, for which reason no specific references to the results of other workers will be made. In addition to the inherent justification for such a course there is the further fact that, so far as is known, no report of the use of the precise regime considered here has hitherto appeared.

Control of Excessive Uterine Bleeding

Prolonged and excessive uterine bleeding is the most urgent menstrual disorder for which patients seek treatment.

It is convenient, therefore, to consider this aspect of therapy first, and in so doing emphasis may be laid at the outset upon the necessity for establishing the *dysfunctional* nature of the condition. Particularly in the case of older women must steps be taken to exclude neoplastic causes; however, in most cases admission to hospital for the necessary curettage is seldom possible without more or less considerable delay, during which the patient naturally expects relief. Unless, therefore, the patient's condition is so extreme as to warrant immediate admission, it is clearly permissible to employ such therapy as may be expected to control dysfunctional uterine bleeding, when, should the treatment fail, the case automatically becomes one for urgent admission, the suspicion of neoplasm being rendered greater by the failure of hormonal treatment.

For the control of excessive uterine bleeding oestrogens are generally effective and reliable, statements to the contrary notwithstanding. The action is undoubtedly initially that of a direct haemostatic, and, in general, adequate dosage secures complete arrest or obvious amelioration of the bleeding within 48 hours of the beginning of treatment. Stilboestrol in a dose of 2–5 mg. daily is suitable for this purpose, but it has the drawback of producing toxic symptoms in a small but important proportion of patients (important because, as will appear, interruption of therapy is not permissible). Dienoestrol and hexoestrol, in my experience, have proved far less effective than stilboestrol, even allowing for the differences in potency, and it is to be hoped that ethinyl oestradiol may solve the problem posed by the tendency of stilboestrol to be poorly tolerated. However, limited experience with this new and highly potent synthetic oestrogen is not too encouraging at present.

In the event of the initial dose proving insufficient for the arrest of haemorrhage, there should be no hesitation in doubling it; the patient, in fact, is told to do this if after 48 hours there is no sign of improvement. Whatever be the appropriate dose for the arrest of haemorrhage, it is clearly imperative that this dose must be taken daily after the bleeding has stopped, since to reduce it or to stop its administration would provoke an oestrogen-withdrawal bleeding a few days later. Daily administration should therefore continue for a total of 20 days. After an interval which may vary from three to 10 days, an oestrogen-withdrawal bleeding begins and oestrogen administration should be recommenced so as to start the process of cycle regulation (see below). Occasionally, bleeding recommences while the course of oestrogen is being taken; in such an event the patient should be told to stop the treatment, wait for the fifth day of the bleeding episode, and then start treatment again. If the initial dose has been 5 mg. of stilboestrol daily, it may usually be reduced to 2 mg. daily in subsequent courses, but it seems that a smaller dose is seldom advisable in these early stages of treatment.

There are other hormonal methods for the control of excessive uterine bleeding, such as the use of testosterone and progesterone (preferably in combination), but since they involve parenteral administration no further attention will be given to them here. In severe cases the efficacy of complete curettage deserves careful consideration, and this measure is rendered more effective if oestrogen administration is begun at the same time.

Where anaemia of more than minimal degree exists treatment with haematinics should be given *pari passu* with other therapy.

Cycle Regulation

The immediate control of uterine bleeding having been achieved, it now becomes necessary to attempt regulation of the cycles so that normal regular bleeding episodes may ensue. Mere cessation of treatment will be followed in most cases by a relapse to the pre-treatment condition: ignorance of this fact has been the basis for many opinions that endocrine treatment has little value in dysfunctional uterine bleeding. Since the great majority of cases of irregular excessive uterine bleeding are associated with failure of ovulation, treatment cannot claim to have been fully curative unless ovulation has been re-established. Where there is a complaint of infertility this is clearly of paramount importance, but its desirability in other cases is also worthy of emphasis, since relapse is decidedly less probable if ovulation has been re-established than if the succeeding cycles are anovular. In cases of climacteric bleeding the position is plainly different, and attempts at inducing ovulation are doomed to failure; certain modifications in treatment are therefore necessary, and will be considered later.

On the fifth day of the oestrogen-withdrawal bleeding resulting from the controlling course of treatment, a new course should be started: 2 mg. daily of stilboestrol is usually a suitable dose and should continue for 20 days. The third course starts on the fifth day of the resultant "period" and is similar in all respects to the preceding course. The effects of the oestrogen therapy are fivefold: there is direct uterine haemostasis; the pituitary is inhibited and as a result ovarian inhibition follows; the pituitary-ovarian relationship which had previously resulted in a more or less constant oestrogen output by the ovary is brought to an end; and finally, when the oestrogen administration is stopped, there is a temporary release of pituitary activity. It is probable that the regular releases of pituitary activity occasioned by the regular cessation of oestrogen therapy play an important part in determining the resumption of cyclic pituitary function, and at this point the opportunity may be taken of stressing the fundamental importance of absolute regularity of treatment if regularity of results is to be obtained. In this connexion it has been found useful to employ a duplicated form providing the necessary instructions to the patient, and in which the appropriate data (number of tablets, number of days, etc.) are written. I use the following:

> Start taking.....small tablets daily on the...../.....th day of the cycle for.....days.
>
> Start taking.....large tablets daily on the...../.....th day of the cycle for.....days.
>
> Wait for the period to commence, and on the...../.....th day of the cycle start taking.....small tablets daily for.....days.

("Small tablets" refers to oestrogens, "large tablets" to ethisterone; the form allows either the date for starting the course of tablets or the day of the cycle to be specified, unnecessary words being deleted as appropriate.)

The fourth, fifth, and sixth cycles are conditioned by combined treatment with oestrogen and progestogen. The following appears to be a satisfactory regime: 2 mg. of stilboestrol is given daily for 20 days, starting on the fifth day of the cycle, and from the 15th day of the cycle ethisterone (anhydrohydroxyprogesterone) in a dose of 20 mg. daily is given for 10 days. During the last 10 days of the treatment course both hormones are thus taken simultaneously. For the fifth course the dose of stilboestrol is reduced to 1 mg. daily and that of ethisterone increased to 30 mg. daily; for the sixth course the daily doses are 0.5 mg.

and 40 mg. respectively, other details of administration being the same as in the fourth cycle. With the combined treatment the interval between cessation of treatment and onset of uterine bleeding is less than that with oestrogens alone, usually being two or three days as compared with four to six days. This regime results in ovulation in a useful proportion of cases, as will be shown later. With the low dose of stilboestrol employed in the last treatment cycle, ovulation may occur during that cycle (as may be concluded from the occurrence of conception during such a cycle in patient No. 35—see below). There seems, in fact, to be good reason to conclude that the administration of oestrogen and progestogen has an action on the pituitary gland, causing the latter to function in the manner necessary to determine ovulation. Regular ovular cycles follow cessation of treatment in successful cases, regular anovular cycles or the occurrence of irregular (but normal) periods at long intervals in less successful cases.

In some cases difficulty may be experienced in the initial production of regular oestrogen-withdrawal bleedings; it seems wise in these circumstances to persist with oestrogens alone until regularity has been achieved before starting the combined courses of treatment. As mentioned previously, the induction of ovulation is not attempted in patients with climacteric bleeding, and, in these, several regular courses of oestrogen therapy, the dose per course being reduced gradually, are usually adequate to secure the occurrence of moderate bleeding episodes leading to a calm menopause. For these patients individualization of therapy is essential, and attempts at following a rigid system are unlikely to yield satisfactory results.

Regular Menorrhagia

Excessive uterine bleeding of an entirely different type is that which occurs as regular periods in which the loss of blood is very heavy, though not necessarily prolonged. In many cases premenstrual endometrial biopsies show secretory changes, so that the occurrence of ovulation may be inferred. There seems to be little doubt that the cause of the excessive loss is different from that in the irregular type previously considered. Investigation may reveal the presence of fibroids, hypothyroidism, anaemia, or various other local or systemic conditions, and thereby indicate the correct line of treatment. Careful questioning may indicate an emotional basis, the correction of which, though often difficult, may effect a cure. There remains, however, a residue of cases in which no obvious underlying disturbances can be discovered; in these, treatment with hormones is seldom effective and is very likely to make matters worse by disturbing the menstrual rhythm. In such cases good results can be achieved by correcting the accompanying anaemia that is nearly always present and by the administration of a non-saponifiable liver extract (antimenorrhagic factor "glanules," Armour). It is probable that the active principle of this extract, whatever it may be, has a direct action on the blood vessels. The chief drawback, in my experience, is the necessity for uninterrupted treatment, at a dosage of two capsules thrice daily, in order to prevent relapses.

Irregular (Chiefly Scanty and Infrequent) and Anovular Cycles

Patients whose complaints are referable to menstrual disturbances comprised under the above heading are of two types: those whose primary complaint is of infertility, and those who believe the menstrual irregularities are themselves indicative of ill-health. For the latter, after systemic diseases have been excluded, reassurance is theoretically sufficient if child-bearing is not contemplated, though in practice this may be impossible to achieve, so deep-rooted is the conviction that unless a woman has a "good" period at reasonably regular intervals something must be "wrong." If present sterility and future child-bearing are pertinent considerations, the production of ovulation, and preferably regular ovulation, is the obvious object of treatment.

Where the cycles are irregular, regulation as well as induction of ovulation is necessary, and, for reasons already given, treatment is best started with oestrogens alone, to be followed later with oestrogens and progestogens. The regime described under "Cycle Regulation," using stilboestrol and ethisterone, is suitable for this purpose. Where the cycles are regular but anovular, cycle regulation is unnecessary, and the combined treatment alone may be expected to produce ovulation in a useful proportion of patients so treated.

Secondary Amenorrhoea

Where no spontaneous period has occurred in the preceding year or more, treatment along the lines described usually produces withdrawal bleedings, but, as will be seen, the resumption of regular spontaneous cycles after the completion of treatment is exceptional.

Results of Treatment

It is now proposed to offer evidence for the foregoing statements, based on experiences with the group of patients already described. This will be mainly of summary type, but reports of more outstanding cases are given in some detail. The overall results of treatment are given in Table I.

TABLE I.—*Overall Results of Oral Treatment Summarized*

Group	No. of Patients in Group	Results of Treatment*				
		Excellent	Satisfactory	Failure	Ovulation After Treatment	Pregnancies
1. Prolonged and excessive bleeding; irregular cycles	19	7	9	2	8	3
2. Excessive bleeding; regular cycles	7	5 (A.M.F. 4 myomectomy 1)	—	2	—	—
3. Irregular (chiefly scanty and infrequent) periods	9	4	2	3	3	1
Regular anovular cycles	4	3	1	—	4	2
	13	7	3	3	7	3
4. Secondary amenorrhoea	13	1	1	9	—	—
Totals ..	52	20	13	16	15	6

* These results do not include two spontaneous cures (Groups 1 and 4) and one pregnancy following gonadotrophin therapy after failure of oral treatment (Group 4).
A.M.F. = Antimenorrhagic factor "glanules" (Armour).

1. Prolonged and Excessive Uterine Bleeding (Irregular Cycles)

The ages of the 19 patients in this group ranged from 13 to 45 years, and the duration of symptoms before treatment from four months to 15 years. There were two patients (Nos. 2 and 3) in whom psychogenic factors loomed large; good initial control was secured in one of these, though relapse soon occurred in spite of continuing treatment, but removal of the cause—the patient was very unhappy as a student nurse at another hospital and very happy on giving up this activity—produced a cure. In the other case the treatment was never taken properly and so was a complete failure; this patient was referred for psychotherapy. One patient (No. 4), with symptoms lasting six months, underwent spontaneous cure, a secretory premenstrual biopsy

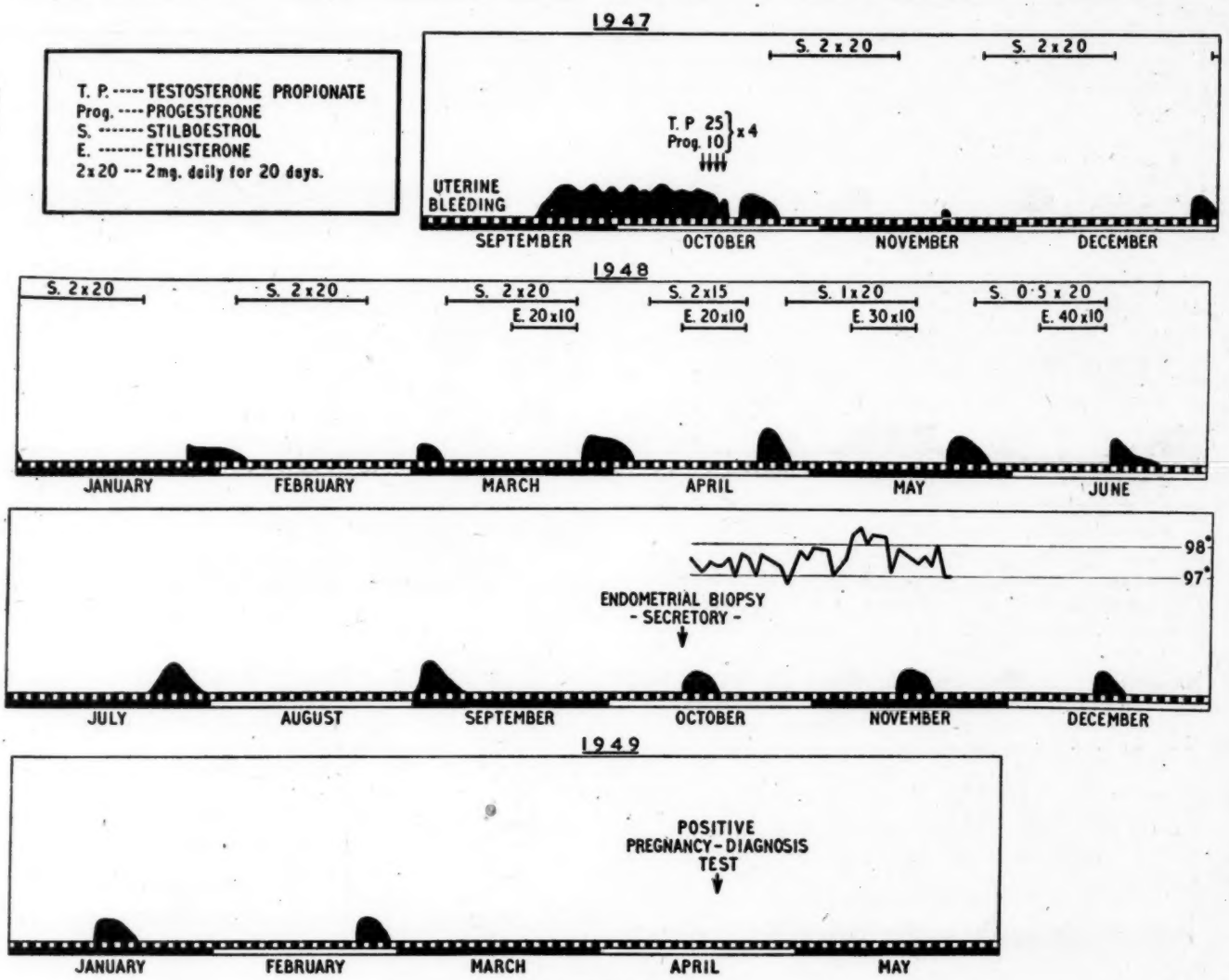

FIG. 1.—Chart of Case 6

having demonstrated the re-establishment of ovulation. In the remaining patients the immediate control of bleeding was good in 14 instances, fair in one, and poor in one; this last patient (No. 15) underwent a second course of treatment, good immediate control being obtained on this occasion.

In the earlier part of this study the combined treatment courses were of constant dosage—stilboestrol, 2 mg. daily for 20 days, and ethisterone, 20 mg. daily for the last 10 of these days, in each of the three combined treatment cycles; these are indicated by the term "C.D." (constant dosage). Where treatment has followed the plan previously described, the term "D.S.–I.E." will be used as symbolical of the diminishing stilboestrol and increasing ethisterone dosages. Endometrial biopsies* were taken before treatment in nine cases; they showed a proliferative type of endometrium in seven cases and cystic glandular hyperplasia in two. In no case, therefore, was evidence of ovulation obtained. Biopsies were taken after treatment in eight instances (excluding the case of a spontaneous cure) and showed secretory changes in seven of them. The single instance of a post-treatment proliferative biopsy (No. 9) followed a "C.D." course of treatment, and relapse occurred three months afterwards; a "D.S.–I.E." course of treatment was then used, and three months after the end of this second course the endometrium was found to be secretory. Three pregnancies have occurred 2 months, 5½ months, and 9 months respectively after the end of treatment. As post-treatment secretory biopsies had been obtained in two of the pregnant patients, evidence for the re-establishment of ovulation is therefore available in eight of the treated cases.

Results have been excellent in seven of the 18 treated cases, regular ovular cycles having been established or conception having occurred; they have been satisfactory in nine cases, the resulting periods being irregular (but otherwise normal) or anovular, or subsequent relapse having occurred; and there have been complete failures in the two psychogenic cases. Further courses of treatment have been necessary in six of the nine "satisfactory" cases. Five patients received the "C.D." course of treatment; an "excellent" result followed in one of these only, further treatment being necessary in the remainder.

Some representative case reports are given below.

Case 1.—A schoolgirl aged 13. Menarche 11 years 9 months. Periods were regular for nine months, lasting five or six days and recurring about every 28 days. Since then there has been irregular prolonged bleeding. No flooding. Examination under anaesthesia (August 28, 1947) revealed an anteverted slightly enlarged uterus; curettage produced polypoidal proliferative endometrium. Heavy, irregular bleedings followed. Treatment.

*In all the instances recorded the endometrial biopsy has been taken during a bleeding episode or in the pre-bleeding phase, as evidenced by the occurrence of the period within a few days of the biopsy.

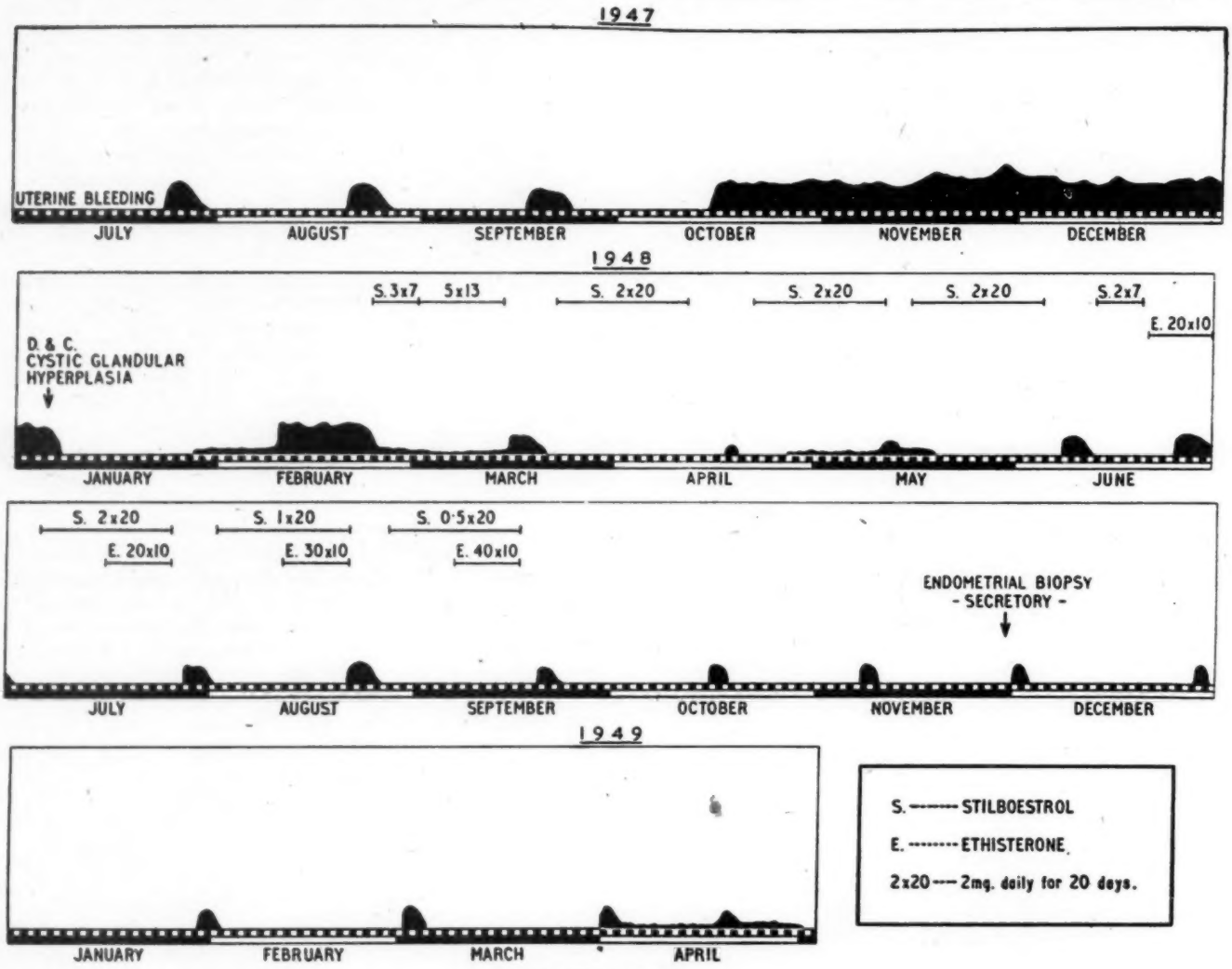

FIG. 2.—Chart of Case 14.

begun December 1 with stilboestrol 3 mg. daily, brought prompt arrest of bleeding. In the 12 months following cessation of treatment there have been only three periods, all of normal type. Further treatment is contemplated.

Case 4.—An unmarried packer, aged 22. Menarche 12½. Periods regular, lasting three days (rather scanty) and recurring every 28 days. In December, 1947, she moved house and changed her job; a period started December 8 and lasted for three months. Following this there was irregular bleeding until she was admitted on April 14, 1948; examination revealed no abnormalities, and the bleeding stopped the next day. Since then regular periods have occurred, although no treatment had been given, and a biopsy taken at the start of the second period showed a normal secretory endometrium.

Case 6.—A housewife aged 23. Menarche 15. Periods were irregular, lasting five or six days and recurring at intervals of one to three months. The irregularity persisted, passing into amenorrhoea, which lasted for three years. During the year preceding admission prolonged irregular heavy bleedings had been the rule in spite of treatment with various hormones, including oestrogens, progesterone, and gonadotrophins. At the time of admission bleeding had been continuous for four weeks. Examination revealed no gross abnormalities, and bleeding was controlled with four daily intramuscular injections each of 25 mg. testosterone propionate and 10 mg. progesterone. On the fifth day of the resultant progesterone-withdrawal bleeding, treatment with stilboestrol, 2 mg. daily, was started. The case is illustrated in Fig. 1, which shows the occurrence of regular cycles during and after the end of treatment. Pregnancy was diagnosed nine months after the completion of treatment.

Case 9.—A housewife aged 27. Menarche 12. Periods were irregular for the first year or so, lasting six or seven days and recurring every 14–50 days. They were heavy. Regular periods followed until six months before she was first seen. At that time irregular intermenstrual spotting began, gradually developing into prolonged irregular and excessive bleeding. She had had one child three years before. Examination revealed no abnormalities. Bleeding was easily controlled with stilboestrol, 5 mg. daily, and regular cycles followed the "C.D." course of combined treatment. A biopsy taken just before the second spontaneous cycle showed a proliferative endometrium. Shortly afterwards a relapse ensued, and dilatation and curettage was performed because of the severity of the bleeding. Subsequent treatment with a "D.S.-I.E." course led to the re-establishment of normal ovular cycles.

Case 14.—A housewife aged 35. Menarche 12. Periods were regular, lasting three days and recurring every 28 days. She had had two pregnancies, the last eight years previously. Five months before she was first seen continuous heavy bleeding began (October, 1947). In January, 1948, dilatation and curettage revealed cystic glandular hyperplasia, and bleeding ceased for three weeks. Moderate bleeding then followed for two weeks, followed by heavy bleeding for a further two weeks. Stilboestrol, in a dose of 3 mg. daily, reduced the bleeding considerably, and after one week the dose was increased to 5 mg. Slight oozing persisted, becoming a withdrawal bleeding of the usual type on cessation of oestrogen administration. Thereafter fairly satisfactory control was obtained, a secretory endometrial biopsy being found in the third cycle after cessation of treatment. Four months later, however, prolonged

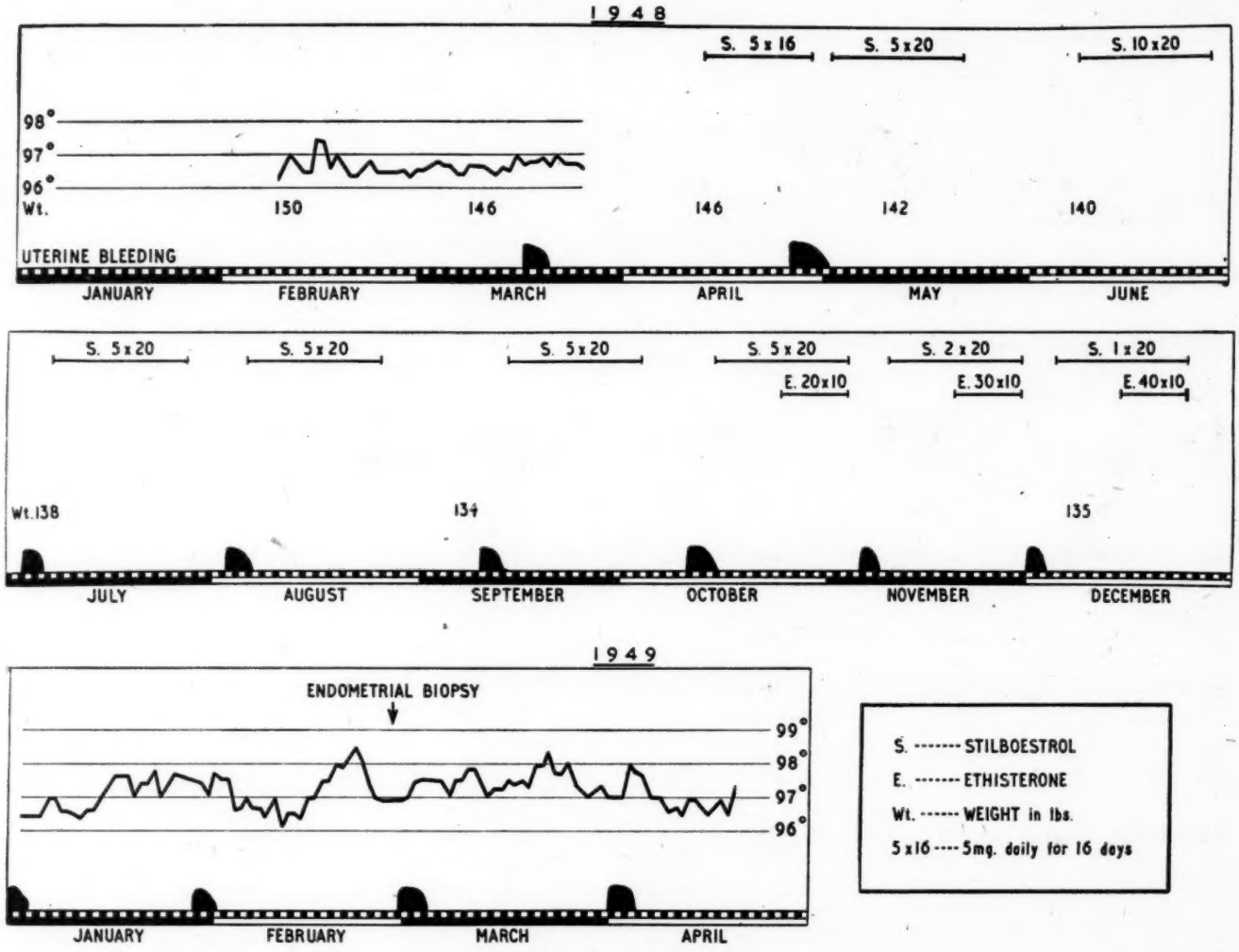

FIG. 3.—Chart of Case 31

bleeding began again, and further treatment is now being given (Fig. 2).

2. Regular Menorrhagia

The ages of the seven patients in this group were between 16 and 39 years, and the duration of symptoms at the time when the patients were first seen varied between one and 16 years. Secretory endometria were found in three patients before treatment, the endometrium being proliferative on three occasions (not necessarily premenstrual) in another patient, on whom myomectomy was eventually performed, after the failure of several forms of therapy, with complete cure. Poor results with oestrogens were obtained in two cases and with antimenorrhagic factor in two cases, one of which had the myomectomy described above. The other failure with antimenorrhagic factor is considered to be a case of emotional menorrhagia, and is described briefly below.

Case 21.—A housewife aged 25. Menarche 11; except for amenorrhoea for one year at 17, periods were regular, lasting three or four days and recurring every 28 days. Some time ago the patient came under the influence of a fortune-teller, who predicted that she would lose her first child; in 1944 she gave birth to a stillborn foetus with spina bifida. There followed two very heavy periods; then she conceived again, a normal infant being born in 1945. Since then she has worried over the possibility of losing her surviving child, and the periods, not quite so regular as before, have been very heavy, lasting eight or nine days. Examination revealed a large cervical erosion but no other abnormalities; curettage produced secretory endometrium. Haemoglobin 96%. Treatment with antimenorrhagic factor had no appreciable effect. She has been advised to have another pregnancy.

Good results with antimenorrhagic factor were obtained in four cases; in one of these incapacitating dysmenorrhoea has also been relieved; in two others retroversions were present, and correction with Hodge pessaries had had no effect on the menorrhagia.

3. Irregular (Chiefly Scanty and Infrequent) and Anovular Cycles

The ages of the 13 patients in this group ranged from 17 to 42 years and the duration of symptoms from seven months to 19 years in the cases of oligomenorrhoea. Biopsies taken before treatment in five cases showed proliferative endometria; after treatment four secretory biopsies were obtained. Evidence of ovulation occurring after treatment (secretory endometrium, conception, ovular type of basal temperature chart) was obtained in six cases. In three cases of oligomenorrhoea regular withdrawal bleedings occurred during treatment, but no spontaneous cycles followed its cessation; these, then, were complete failures. In two other cases regular spontaneous cycles were produced, but these were most probably anovular; in the remainder, ovulation was either definitely or possibly produced in one or more cycles following cessation of treatment. One patient conceived (see below, Case 35). There were four cases of regular anovular cycles; after treatment evidence of ovulation was obtained in all four and two conceived (Cases 32 and 34). Three case reports are given below.

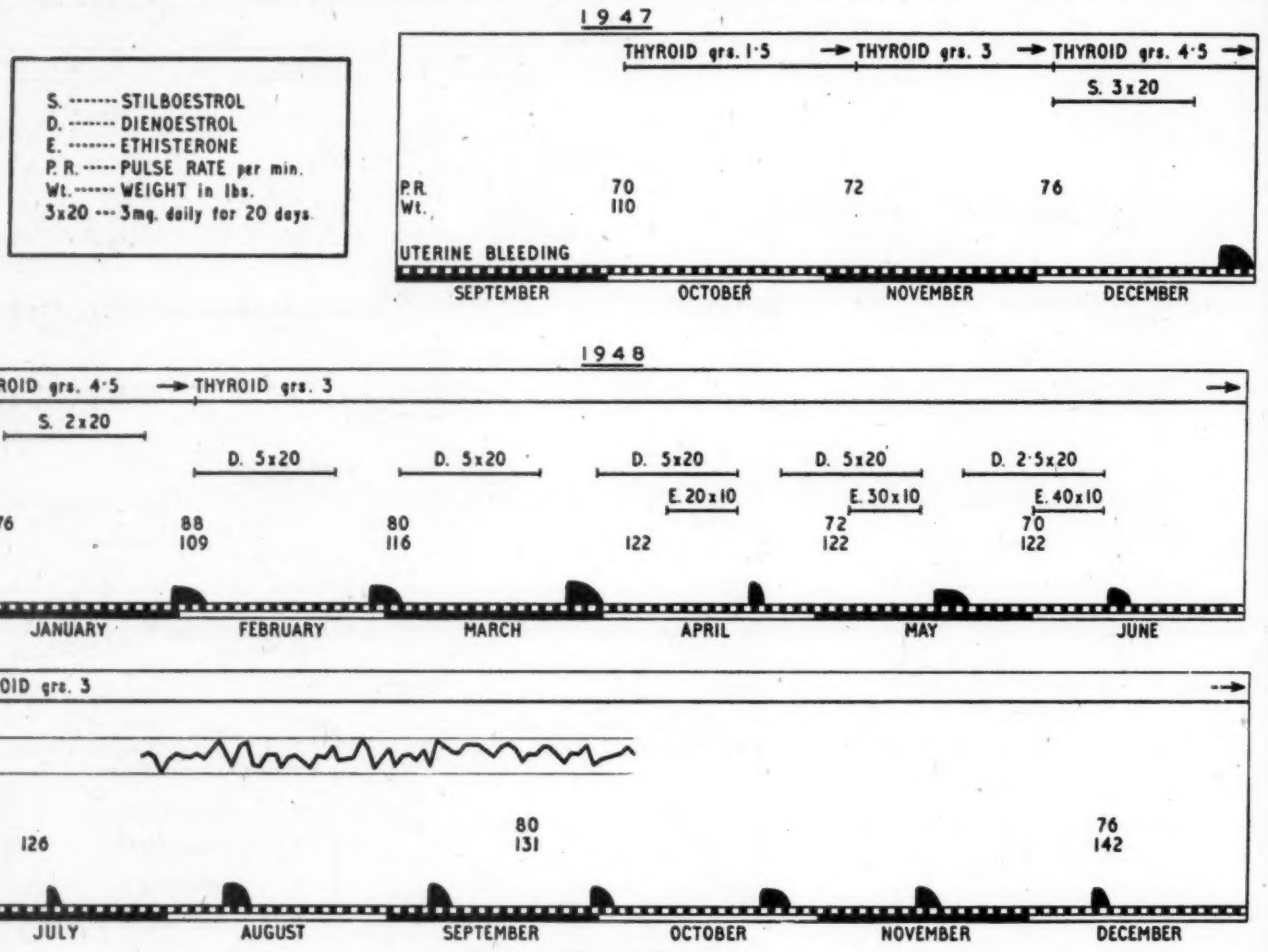

FIG. 4.—Chart of Case 45

Case 31.—A married part-time secretarial worker aged 26. Menarche 15; periods always irregular, lasting six or seven days and recurring at two-monthly to three-monthly intervals. On examination moderately obese; external genitalia normal; uterus of normal dimensions (sound passed 3½ in.—8.75 cm.); vaginal smear of castrate type; B.M.R. +3. Treatment with 1,000-calorie diet, thyroid sicc. gr. 1 (65 mg.) daily, and dextro-amphetamine sulphate, 5 mg. thrice daily, produced moderate weight reduction (15 lb. (6.8 kg.) over a period of seven months). The doses of steroid hormones given are shown in Fig. 3, and it can be seen that regular periods have followed cessation of treatment. The basal temperatures are suggestive of ovulation, but the endometrial biopsy produced only minute fragments of endometrium in spite of repeated scraping, and it seems reasonable to infer that some degree of unresponsiveness on the part of the endometrium must exist.

Case 34.—A housewife aged 28. Menarche 14. Periods always regular, lasting three days and recurring every 28 days. Patient investigated for infertility; basal temperatures suggested anovular cycles, confirmed by premenstrual endometrial biopsy. After a "D.S.–I.E." course of treatment the premenstrual biopsy was found to be secretory, and basal temperatures many months later were of ovular type. She conceived, but aborted at 13 weeks.

Case 35.—A married part-time secretarial worker aged 32. Menarche 13; periods always irregular, lasting generally three to four days and recurring at intervals of three months to two years. She had had various treatments, including thyroid, stilboestrol, and gonadotrophins. Examination revealed no abnormalities. A biopsy taken on the first day of a presumably spontaneous period showed bleeding from a proliferative endometrium. Treatment started with stilboestrol, 5 mg. daily, and progressed to the usual "D.S.–I.E." course. No withdrawal bleeding followed the last course of treatment, and two months after the last period the Friedman test was found to be positive. It is reasonable to conclude that ovulation occurred during the last course of treatment. The pregnancy is progressing normally.

4. Secondary Amenorrhoea

The ages of the 13 patients in this group ranged from 17 to 37 years and the duration of symptoms from one to seven years. In one case (No. 41) there was spontaneous resumption of regular ovular cycles (as indicated by the basal temperatures) after 16 months' amenorrhoea without treatment. In another case (No. 45), with two-and-a-half years' amenorrhoea, a castrate type of vaginal smear and a B.M.R. of −16.5 were found; treatment with thyroid substance and later with dienoestrol and ethisterone along lines previously described produced regular spontaneous cycles, which, however, appeared to be anovular as judged by the basal temperature chart (Fig 4). Spontaneous periods were resumed nine weeks after the cessation of treatment in a third case (No. 42), in which there had been seven years' amenorrhoea. There was a further case (No. 48) in which, the second pregnancy having produced an anencephalic monster, two scanty periods followed, to be succeeded by amenorrhoea lasting one year; withdrawal bleedings were produced by the usual oral treatment, but there was no spontaneous resumption of menstruation. Conception, however, occurred during gonadotrophin treatment (pregnant mares' serum, 500 i.u. intramuscularly daily for eight days, followed immediately by chorionic gonadotrophin, 500 i.u. intramuscularly, daily also for eight days), but was followed by abortion at approximately seven weeks. Within two months conception again occurred, as proved

by a positive Friedman and male-toad test; and as a prophylactic measure six pellets of progesterone, 25 mg. each, were implanted subfascially. The pregnancy continues. The remainder of the cases of this group may be summarized as complete failures, in so far as no spontaneous periods followed the cessation of treatment.

Intolerance to Stilboestrol

Treatment with stilboestrol was attempted in 46 of the cases reported here; intolerance was shown by seven (15%), necessitating change of treatment. Dienoestrol was used in six cases; it gave good results in two of these (Nos. 37 and 44) and poor results in the remainder.

Discussion

The foregoing results appear to justify certain definite conclusions: (1) oral stilboestrol is an effective and reliable agent for controlling prolonged and excessive uterine bleeding; (2) given in the manner described, and subsequently combined with ethisterone, it can produce excellent end-results in about 40% of patients having irregular prolonged and excessive uterine bleeding, and satisfactory results in a further 50% of these patients; (3) it has no value in the treatment of regular menorrhagia and little or none in the treatment of secondary amenorrhoea of more than a year's duration; (4) the combined treatment seems to be of considerable value in producing ovulation in cases of regular anovular cycles and of less definite value in the treatment of oligomenorrhoea.

The relapse rate in apparently cured cases of irregular prolonged and excessive uterine bleeding is comparatively high; relapse occurred in five patients, three of whom had received a combined course in which the dosages of stilboestrol and ethisterone remained constant in successive months. In only one of the cases wherein relapse had occurred was evidence of ovulation after treatment obtained, which provided the justification for the remark made previously that the re-establishment of ovulation renders the liability to relapse considerably less. The fact, however, that relapse may occur even when ovulation has been restarted is not altogether surprising, and is a reflection of the instability of the menstrual rhythm which is a fundamental defect in all cases of menstrual irregularity.

The question of dosage in the controlling course of stilboestrol deserves further consideration. But for the liability to produce toxic symptoms, and the obvious disadvantages of this, there would be much to be said for erring on the side of excessive rather than inadequate dosage. There seems little doubt, however, that many patients who have experienced toxic symptoms from stilboestrol will continue to have them, even on much smaller doses, so that avoidance of such side-effects at the outset is much to be desired. The dosage levels in common use, such as "5 mg. t.d.s.," are for most purposes grossly excessive and largely responsible for the prevalent opinions regarding the high toxicity of this excellent, potent, and cheap oestrogen. A dose which is sufficient to have a haemostatic action may in fact prove insufficient to prevent the recurrence of bleeding while it is still being taken: it is probable that this occurs most often when the endogenous oestrogen production is high (as where cystic glandular hyperplasia exists). A reasonable explanation would be that the oral oestrogen, by inhibiting the pituitary, causes a reduction of the endogenous oestrogen output, so that the combined stimulus to the endometrium becomes reduced, the overall effect being similar to an oestrogen-withdrawal bleeding. Had the dose been higher the combined oestrogen level would have fallen

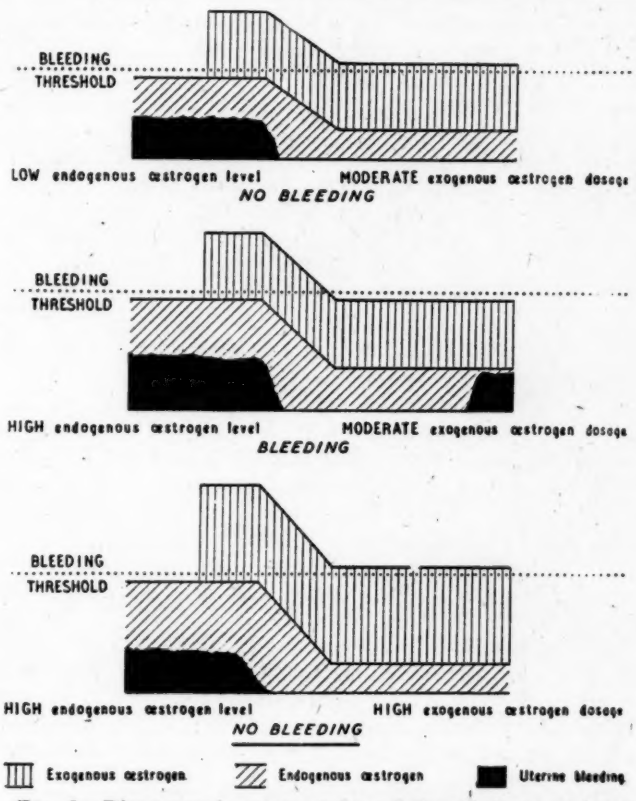

FIG. 5.—Diagrammatic representation of the effects of moderate and high exogenous oestrogen doses in cases with low and high endogenous oestrogen levels.

relatively less and so no withdrawal bleeding would have resulted (Fig. 5). This recurrence of bleeding need not be considered as of serious import if the advice given—namely, to stop oestrogen administration and to start again five days later—is followed. The pituitary inhibition will not have passed off completely within this time and the endogenous oestrogen production will not have reached its pre-treatment level, so that the second oestrogen course will be far less liable to interruption through the inopportune return of bleeding. One final point regarding oestrogen dosage may be made: in general it is safe to assume that the therapeutic dosages of oestrogen and the tolerance towards them bear a direct relation to the level of endogenous oestrogen production. In practice, this means that dosage must be carefully limited at either end of the reproductive period and can be almost unlimited during pregnancy.

Great interest attaches to the not infrequent occurrence of ovulation after treatment in patients who were presumably or definitely anovular before treatment. In the series of patients reported there were, among the cases of irregular excessive bleeding, oligomenorrhoea, and regular anovular cycles, 14 instances in which definite evidence of non-occurrence of ovulation was obtainable and a further 17 in which it was presumptive. Evidence of ovulation after treatment was obtained in 15 of these cases, representing nearly 50% success. (In one patient with menopausal menorrhagia, induction of ovulation was not attempted.) In a further six patients the opportunity of deciding whether or no the post-treatment cycles are ovular has not arisen, so that the actual success rate may be even higher. To be set on the debit side of the account are the two instances of spontaneous resumption of regular ovular cycles—in one case following prolonged irregular bleeding, and in the other 16 months' amenorrhoea, both without any form of treatment. The superiority of the "D.S.-I.E." type of

combined course over that represented by "C.D." for the induction of ovulation would appear to be demonstrated by the fact that ovulation was shown to have occurred after the "C.D." course in only two out of the nine cases in which it was used, whereas the "D.S.–I.E." course succeeded in one case where previously the "C.D." course had failed. Final conviction would seem to be provided by the occurrence of six pregnancies within 0 to 9 months of the completion of treatment, failure of ovulation having been the case prior to treatment in all of these patients.

A sobering note must, however, be struck by the conspicuous failure to produce ovulation in cases of long-standing secondary amenorrhoea as well as most cases of marked oligomenorrhoea.

It is tempting to speculate upon the mechanism whereby treatment with oestrogens and progestogen can lead to ovulation, but in the present lack of factual knowledge it would be unwise to proceed too far. That a direct action on the ovary could be implicated seems scarcely possible, so that one must invoke the anterior pituitary lobe as an intermediary, causing ovulation by the secretion of gonadotrophin. Unfortunately, although oestrogens can undoubtedly inhibit the pituitary, it is much less certain that they can have a stimulant action, and such an action is indeed strenuously denied by some. Be this as it may, it seems that the regular administration of oestrogens and progestogen, in the proper dosage, can so condition the pituitary gland as to secure its production of gonadotrophin in the manner necessary to cause ovulation.

Summary

A regime involving the oral administration of oestrogen and ethisterone for the treatment of menstrual irregularities has been described. Encouraging results have been obtained in cases of irregular prolonged and excessive uterine bleeding, using stilboestrol for the immediate control of bleeding and proceeding to treatment designed to regulate the cycles and re-establish ovulation. Moderate success was achieved in cases of oligomenorrhoea and regular anovular cycles; the treatment has had little value in cases of regular menorrhagia (for which the antimenorrhagic factor ("glanules," Armour) proved useful) and of long-standing secondary amenorrhoea.

The treatment appeared to be responsible for the re-establishment of ovulation in at least 15 out of 30 patients (not including cases of secondary amenorrhoea and menopausal menorrhagia) in whom failure of ovulation had been presumed or proved. Pregnancy occurred in six patients.

Intolerance to stilboestrol was encountered in only seven out of 46 patients to whom it was given.

[Restriction of space precludes publication of the details of all the cases in this study. However, for those interested, Tables II–V, listing these details in summary form, will be provided on application to the author.]

I wish to express gratitude to my colleagues in the Obstetric Hospital, University College Hospital, for their kind co-operation in this study, and to Messrs. Armour and Co., Ltd., for supplying some of the antimenorrhagic factor "glanules" used.

REFERENCE

Hamblen, E. C. (1945). *Endocrinology of Woman.* Thomas, Springfield, Ill.

The National Smoke Abatement Society has published as a booklet the proceedings of its conference held at Harrogate last autumn. The booklet includes the presidential address by Lord Simon of Wythenshawe on "A Survey of Domestic Smoke Abatement," and an address by Mr. Arthur Blenkinsop, M.P., Parliamentary Secretary to the Ministry of Health. It is obtainable for 4s. 6d. from the society at Chandos House, Buckingham Gate, London, S.W.1.

DEFICIENCY PATTERNS IN METALLIC POISONING

BY

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The account of the investigation which led finally to the discovery of 2:3-dimercaptopropanol (dimercaprol; British anti-lewisite—"BAL") (Carleton, Peters, *et al.*, 1946) makes one of the most fascinating chapters in the history of medical research. Peters (1936) gives as his starting-point the observation that the convulsions in thiamin deficiency could be traced to a biochemical lesion in which the pyruvate–oxidase system broke down through lack of thiamin. The enzyme was shown to consist of thiamin pyrophosphate linked with a sulphur-containing protein. The protein moiety of the system could be poisoned by iodoacetic acid, and thus the biochemical lesion could occur even in the presence of adequate thiamin. Iodoacetic acid is a mild vesicant—vesication is the outstanding effect produced on epithelial surfaces by lewisite. It was demonstrated that lewisite poisoned the pyruvate–oxidase system, and that its action was due to its avidity for the SH groups of proteins in the enzyme. The next step was to find a sulphur-containing compound which would compete with the protein for the available arsenic, and the dithiol, 2:3-dimercaptopropanol, was found to do this most effectively. Subsequent investigations have shown that dimercaprol is effective in other forms of metallic poisoning, including mercury (Longcope *et al.*, 1946) and gold (Burnett, 1947; Cohen *et al.*, 1947; Davison, 1947; Slot and McDonald, 1947).

While Peters's hypothesis hangs on the biochemical lesion of the pyruvate–oxidase system, it must not be forgotten that many other enzyme systems occur in which the coenzymes contain members of the B_1 complex, and that the specific proteins to which these are attached may also contain SH groups susceptible to poisoning by heavy metals. There is also the possibility that vitamins and factors outside the range of the B complex may form similar linkages with SH-containing proteins. Wherever such systems occur there is the possibility of interference with the protein by a heavy metal. We should expect to find, therefore, as a result of the "biochemical lesions" of metallic poisoning, many anatomical lesions, patterns of lesions, and syndromes which we are accustomed to associate with specific vitamin deficiencies. That these do occur is quite apparent from the accounts of cases in the literature of the subject. There are good examples in the comprehensive review by Carleton, Peters, *et al.* (1946), and in the paper by Longcope *et al.* (1946). In the following case the pattern of lesions was that which might have been expected in vitamin-K deficiency.

Case 1

A man aged 61 was admitted on September 18, 1948, for rheumatoid arthritis. The history went back 20 years, when the condition started in the small joints of the hands.

On admission there was severe involvement of all the peripheral joints of the limbs and also some involvement of the spine, leading to pronounced kyphosis. Psychologically he was difficult to treat and did not co-operate in the physical therapy prescribed. He was therefore put on a course of sodium aurothiomalate ("myocrisin"), starting with a dose of 10 mg. weekly, subsequently increased to 50 mg. weekly. By January 19, 1949, he had received a total of 0.68 g., and on

that day he had a severe epistaxis. The drug was discontinued. A blood count revealed: red cells, 4,500,000; haemoglobin, 10.5 g.%; white cells, 10,000 (polymorphs 74%, lymphocytes 19%, monocytes 6%, and eosinophils 1%). Platelets were much reduced in the films. Bleeding time was 12½ minutes, clotting time 5 minutes 40 seconds.

On January 20 he had further epistaxis and bleeding from the rectum. A petechial rash developed over the extensor surfaces of the limbs and on the face, neck, and half-way down the sternum. There were a few petechiae on the inside of the cheeks and on the side of the tongue. A tourniquet test brought up uncountable petechiae on the forearm. Haemoglobin had fallen to 6 g.%. Dimercaprol, 2 ml. of 10% solution twice daily, was injected for seven days beginning on January 20—a total of 28 ml. He was transfused with one pint (570 ml.) of whole blood on the 20th. Next day his general condition had already improved, and by the 24th the petechiae had obviously begun to fade. The rash cleared up in a week. His rheumatism, which had improved during the administration of aurothiomalate, showed further improvement with the onset of toxic symptoms. He was advised to take up physical therapy, and has continued to improve up to the time of writing.

Although rather spoilt by the blood transfusion the case still retains most of its academic value in that it demonstrates a picture of vitamin-K deficiency in a patient treated with gold. It was unfortunate that a blood transfusion had to be given, but we cannot always decide to give or withhold a line of treatment on purely academic considerations. Fortunately there are reports of similar cases in the literature in which the results were not obscured by blood transfusion. Cohen *et al.* (1947) report success in a case given vitamin K and dimercaprol, and Lockie, Norcross, and George (1947) report failure with vitamin K and success with dimercaprol. It is possible, therefore, that in such cases there is interference with the protein of a compound enzyme in which vitamin K is the prosthetic group.

The distribution of lesions in the next case corresponded exactly with what I have seen and described in many cases of riboflavin deficiency in the Tropics (Hughes, 1946). When riboflavin and B_2-complex therapy had failed to clear up the lesions, an exhaustive inquiry into the history revealed two courses of gold therapy—the last one completed 14 years previously.

Case 2

A woman aged 52 was admitted to Belmont Road Hospital on May 15, 1947, for advanced rheumatoid arthritis. The first lesion, arthritis of the left ankle, occurred 29 years previously. About 19 years ago she was admitted to a hospital—since bombed out and the records destroyed—and given "gold injections." After a course of injections she developed a generalized "pimply rash." Her arthritis was improved, and when the rash cleared up she was discharged. She was admitted to a second hospital in Liverpool on December 2, 1935, with advanced arthritis involving the peripheral small joints and both hip-joints. Her records from this hospital reveal sore, depapillated tongue and achlorhydria, but there is no mention of a rash. She was manipulated and given 9 0.2-g. doses of aurothiomalate during her stay. She was discharged in March, 1936.

About six months before admission to Belmont Road Hospital she first noticed elements of the rash described below. She was bedfast but well nourished, and when I first saw her in the hospital on October 15, 1947, the following epithelial lesions were noted. Tongue: smooth, normal colour, absence of papillae, no fissures. Angles of mouth fissured. "Seborrhoeic" dermatitis moist and weeping, with fissures in deep flexures, but otherwise dry and scaling on a cyanotic background at the following sites: hair margins and to a lesser extent in scalp; in internal and external canthi (with blepharitis) and behind pinnae; in naso-labial grooves; patch on neck with fissures; moist with fissures in axillae, under breasts, in umbilicus, and on extensive area involving perineum extending above pubis in front and the groins and a large area of buttocks behind; on dorsal surfaces of fingers and toes involving roots of nails; and on dorsa of hands and interdigital clefts, extending on to palms (see Figs. 1 and 2).

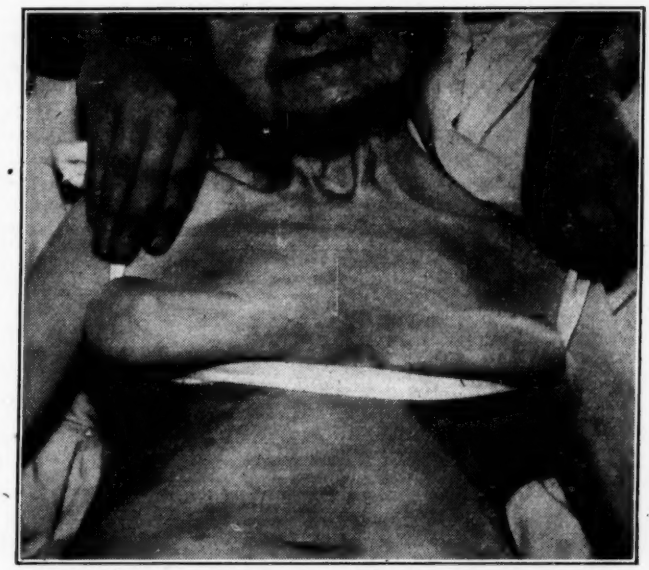

FIG. 1.—Case 2. Appearance of rash in inframammary region after prolonged treatment with vitamin supplements but before treatment with dimercaprol.

FIG. 2.—Appearance of buttocks and thighs after prolonged treatment with vitamin supplements but before treatment with dimercaprol.

The patient was edentulous and disliked vegetables, but she consumed ½ pint (280 ml.) of milk daily and an occasional egg in addition to hospital rations.

Positive laboratory findings of note included occasional pus cells in the urine; stools negative for dysentery organisms during occasional bouts of diarrhoea; blood count on October 27—red cells, 3,800,000; haemoglobin, 9.8 g.%; leucocytes, 7,000, with normal distribution; W.R. negative on two occasions. Cultures from the skin lesions before treatment yielded *Proteus* organisms and coagulase-positive staphylococci.

Riboflavin deficiency was diagnosed and the patient was given large amounts of the vitamin orally and by injection for the next 14 months. Thus, in one period of intensive treatment she received in all 20 mg. of riboflavin by injection and 30 mg. by mouth daily and 2 ml. of "plexan" (crude liver extract) twice weekly. Later, in addition, penicillin was prescribed locally and by injection, and sulphonamides locally and orally. At first the lesions improved somewhat generally, and those on the neck, scalp, and umbilicus disappeared. The improvement coincided with the intensive penicillin and sulphonamide treatment, and progress seemed entirely uninfluenced thereafter by the vitamin supplements, which were continued until February, 1949. At this time the following

was the condition: sore tongue, papillae still absent; both angles of mouth excoriated; slight scaling in naso-labial grooves; large red weeping areas under both breasts; original lesions about pudenda still unchanged in area, weeping in centre, thick scales on a cyanotic background at periphery; slight desquamation still on dorsa of hands and feet.

The diagnosis was reviewed, and her history revealed the two courses of gold therapy mentioned above. Excretion of gold* in the urine in the 24 hours from 9 a.m. on February 2, 1949, amounted to 0.005 part per million—1,000 ml. excreted. After 6 ml. of dimercaprol 10% solution on February 7 and on February 9 excretion of gold in 24-hour specimen from 9 a.m. on the 9th was 0.11 part per million—720 ml. excreted. In the next month she received 26 injections of 2 ml. of 10% dimercaprol. Her lesions had almost disappeared by May 3, when a further three injections of 2 ml. were given (see Figs. 3 and 4).

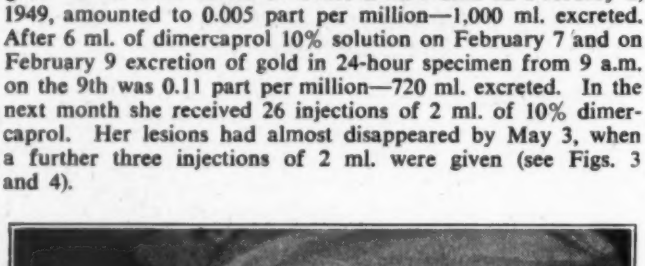

FIG. 3.—Inframammary region after treatment with dimercaprol.

FIG. 4.—Buttocks and thighs after treatment with dimercaprol.

On May 23 she was got up in a chair and sat out in the sun for two days. Her face and hands became sunburned. She complained of photophobia and lacrimation. The tongue became raw and sore, fissures developed at the angles of the mouth, and within a week her skin lesions all relapsed to the state in which they were on October 15, 1947. Gold excretion in 24 hours on May 30–31 was *nil*—1,180 ml. excreted. She was given 6 ml. of 10% dimercaprol in the 24 hours on May 31–June 1 and her gold excretion was 0.008 part per million—1,530 ml. excreted. After 20 mg. of riboflavin daily by injection for a week the lesions improved rapidly, the tongue becoming normal in three days and the angular stomatitis clearing in four days. The weeping lesions under the breasts and pudenda were septic and took longer to heal, but the former had cleared up by June 28 and the latter by July 15. There has been no obvious change in the arthritic condition since admission.

The interpretation of this case is difficult. The original pattern of disease as seen on October 15, 1947, was similar to that which I have seen in many cases of "pellagroid" or pellagra sine pellagra in Malayan and Nigerian prisons and asylums. The pattern of ariboflavinosis can be identified in the tongue, lip, and genital lesions and in flexural "seborrhoea." The scaling on the dorsa of the hands and feet and the occasional bouts of diarrhoea combined with glossitis and buccal ulcers might suggest niacin deficiency. In addition, there was the complication of sepsis. That the condition was not due to a simple deficiency of either or both of these vitamins is suggested by the incomplete response to large doses of riboflavin and crude liver extract. It is considered that in February, 1949, the body reserves of B_2 complex were adequate, and that the residual pattern of deficiency was due to a "biochemical lesion" affecting chiefly the protein of the flavoprotein group of compound enzymes. This hypothesis is borne out by the fact that the gold excretion was accelerated and the lesions cleared up completely after a course of dimercaprol.

Relapse after exposure to sunlight ("photosensitivity") is a phenomenon which is often observed in pellagrins, and it may occur after the disease is apparently cured. It suggests that sunlight creates a demand for more compound enzyme than the body can supply quickly after the prolonged operation of a "biochemical lesion" due to hypovitaminosis. There are not enough data to decide whether the lingering "photosensitivity" in this patient is due to the prolonged action of gold or to hypovitaminosis. We can only note that the case behaves exactly as a pellagrin would in similar circumstances.

The most arresting feature of the "photosensitivity" was the fact that the relapse was complete. It began as sunburn on the face and dorsa of the hands, and the whole original pattern quickly evolved and lesions developed on the tongue, on the original site on the neck, in the axillae, under the breasts, in the umbilicus, and on the pudenda—all of which areas were not exposed to sunlight. We do not know what the factor is which integrates the pattern of lesions in deficiency disease, but it is very unlikely, as some authors suggest, that the lesions are due to casual traumata.

Arsenical Poisoning

Exfoliative dermatitis is common to both gold and arsenical—particularly arsphenamine—poisoning. Something approaching generalized exfoliative dermatitis is seen in severe infantile pellagra.

The treatment of syphilis with arsphenamine continues to provide many examples of exfoliative dermatitis. In the Tropics I saw numbers of these cases, but in this country, where the treatment of syphilis is confined to a few centres, such cases are seen only by practising dermatologists. Recently, through the courtesy of a colleague, I had an opportunity of seeing four cases of arsphenamine dermatitis. Only one need be described.

Case 3.—A woman aged 32 had gonorrhoea and secondary syphilis. From January 14 to February 3, 1949, she had 0.3 g. of neoarsphenamine and 0.1 g. of bismuth seven times. A rash appeared first on the extensor surfaces of both arms above and below the elbows on February 7. From February 7 to 21 she had 6 ml. of "calciostab" 13 times. The rash had extended to the body generally. Dimercaprol, 2 ml. of 10% solution, was injected daily from February 21 to 28.

On February 22 there was general erythema with puffiness of the face; desquamation was most severe in flexures—axillae, groins, popliteal spaces—but was also present about the elbows and on the dorsa of the hands and feet. The lips were red, and the angles of the mouth and canthi were slightly excoriated; the tongue was red and sore, with "strawberry" appearance at the tip; there were no haematological changes. Progress

*The gold was co-precipitated with tellurium from the urine and estimated by titration with standard hydroquinone solution using *o*-dianisidine as indicator. The procedure followed was that of Jamieson and Watson's (1938) modification of Pollard's (1937) method.

under dimercaprol was rapid and uneventful, and the rash had cleared up by March 7.

These cases, from my personal experience and judged from the literature, run to a pattern, but the pattern as a whole does not conform to any one clinical syndrome of deficiency. The interpretation of the epithelial lesions in terms of deficiency patterns is difficult. Thus we might pick out the lesions on the face, neck, and dorsa of the hands and feet to represent a niacin-deficiency pattern and fit in the remaining flexural seborrhoea, glossitis, and cheilosis with ariboflavinosis. This would still leave a very characteristic lesion of the palms and soles to be accounted for. In any case, another observer with a different bias could insist that the exfoliative dermatitis as a whole mostly resembled the pattern of biotin deficiency. In such circumstances there is no room for strong views. It is going far enough to suggest that the exfoliation and glossitis could express the sum of several overlapping deficiency patterns.

Acute encephalopathy is a complication of intensive arsphenamine medication. Lydon (1944) and Sexton and Gowdey (1947) have described cases, and have drawn attention to the close connexion between such cases and cases of Wernicke's encephalopathy. The association of the latter with deficiencies of the B complex, particularly of thiamin, is fairly well recognized. Sexton and Gowdey have tabulated the points of resemblance between arsenical encephalopathy and thiamin deficiency and bring out coincidences in all the characteristic clinical and pathological findings in both diseases. Furthermore, they found raised blood pyruvate content in their patient undergoing intensive drip therapy with oxophenarsine. This, they note, points very definitely to a breakdown of decarboxylation, which, of course, could be due either to an attack on the specific protein of carboxylase or to lack of thiamin.

The chronic arsenical poisoning which follows the prolonged administration of small quantities of arsenic by mouth presents a different picture. This picture bears so close a resemblance to chronic or dry beriberi as to be almost indistinguishable in many cases. It would seem, therefore, that all the recognized forms of arsenical poisoning are characterized by patterns of deficiency.

Mercurial Poisoning

It has often been suggested that infantile acrodynia (pink disease) is a vitamin-deficiency disease closely allied to the tropical infantile pellagra (kwashiorkor). It cannot be said, however, that treatment with vitamin supplements has yielded spectacular results. In any case, the epidemiology of pink disease hardly suggests malnutrition, the condition being much more common among the well-fed children of the temperate zones than among undernourished children in the Tropics. In the circumstances the report of Warkany and Hubbard (1948) that children with pink disease excrete comparatively large amounts of mercury is of special interest. Bivings and Lewis (1948) have reported that dimercaprol accelerated recovery in a case of acrodynia. In this hospital our standard treatment for congestive cardiac failure includes a low sodium intake and frequent mercurial injections. In a paper describing our results we have already mentioned two cases which developed a rash (Reid and Hughes, 1949). In one case only a transient erythema occurred, which subsided in a few days, but the other merits a more detailed description.

Case 4.—A man aged 75 was admitted on May 31, 1948, with residual right hemiplegia and congestive cardiac failure. His blood pressure was 220/135 and he had gross oedema. The oedema responded well in the beginning to mersalyl *B.P.* 2 ml. on alternate days for seven injections. On June 13 a morbilliform rash was noted chiefly on the face, arms, and legs. Mercury was discontinued. He had conjunctivitis, and small buccal ulcers were noted chiefly on the gums. The rash became more generalized, and the patient looked very ill and felt very wretched. He received two 2-ml. doses of 10% dimercaprol on June 29 and 30 and July 9. By the last date the rash had begun to fade, but the morbilliform appearance was still evident up to July 12, and his conjunctivitis had not healed on that date. After this desquamation occurred in fine powdery scales and his conjunctivitis began to clear up. He developed bronchopneumonia and died on July 26. A post-mortem examination revealed some enlargement of the left ventricle, bronchopneumonia, and granular kidneys. Histologically, no trace of any acute degenerative changes in the kidneys was found.

Before comparing the symptoms in this case with those of pink disease it is as well to point out that deficiency diseases vary in their manifestations according to the age of the patient. The most striking example of such a difference is seen in the laryngeal palsy which is characteristic of infantile beriberi but is not encountered in adult beriberi. The difference between adult and infantile scurvy and between rickets and osteomalacia is too well known to need comment. Those who look for elements of deficiency in the case quoted will note the symmetrical distribution of the rash and desquamation—two important characteristics of a pellagraderm and also of pink disease. The conjunctivitis is also a link with pink disease, and so is the irritability. On this evidence, however, it is premature to state that mercurial poisoning causes a deficiency syndrome, and we must await further reports from observers in pink disease and mercurial poisoning.

Thallium Therapy

Through the courtesy of a colleague I have recently been able to observe 12 cases of ringworm in children undergoing thallium treatment. It so happened that two of the children developed thallium intoxication—fortunately a rare occurrence—and were transferred to another hospital, where they died. Two things impressed me about these cases. First, other observers as well as myself (Hughes, 1946) have recorded the fact that the hair in kwashiorkor can be drawn out painlessly in large bunches. If the child survives for a while the scalp becomes completely bald. Secondly, I have emphasized the fact that lethargy going on to coma is a characteristic symptom of kwashiorkor. Epilation and lethargy are the outstanding symptoms of thallium intoxication. Apart from the epilation, I did not notice any epithelial pattern of deficiency in any of these children treated with thallium.

A mild degree of epilation is seen in rickets and in wasting diseases, especially those associated with diarrhoea, such as typhoid fever. In such diseases epilation is only one minor lesion in a complicated pattern. The inference is that epilation is the result of one "biochemical lesion"—possibly the only one that occurs in thallium therapy, but one of many which occur in kwashiorkor. In thallium poisoning presumably the protein of the compound enzyme is affected, while in kwashiorkor the prosthetic group of the compound enzyme—probably a vitamin of the B_2 complex—is deficient.

Discussion

In certain instances of metallic poisoning, and particularly in the case of gold and arsenic, quite definite epithelial patterns of deficiency can be recognized. There are cases, however, in which the pattern is indistinct or does not emerge clearly from the background of the general exanthem. There is a temptation in such cases to read

more into the exanthem than is legitimate. All the same, the fact that deficiency patterns can be recognized in some instances carries greater weight than the fact that they cannot be distinguished in others. The pattern may be there, but it can be obscured by the presence of other patterns and the incidental lesions of sepsis.

Occasionally we get an exact correspondence between the deficiency syndrome and the metallic-poisoning syndrome. A good example of this is the correspondence between the purpura of gold poisoning and that of vitamin-K deficiency. What happens more often, however, is that we can identify a single lesion such as alopecia or a set of lesions such as flexural seborrhoea in cases of nutritional deficiency on the one hand and metallic poisoning on the other.

Cohen *et al.* (1947) have noted the following toxic reactions as common in their experience of gold poisoning: pruritus, seborrhoeic dermatitis, stomatitis, thrombopenic purpura, gastro-enteritis, and conjunctivitis. They quote other observers who give, in addition, peripheral neuritis, dizziness, nausea and vomiting, nephritis, and acute yellow atrophy.

In the complete list there is not one of these reactions which has not been recognized in the various patterns of deficiency disease. One or two may need elaboration. Jaundice, for example, is rare in deficiency disease, but there is increasing support for the view that the jaundice of gold and arsenical "toxic" reactions is really infective in origin. Advanced fatty infiltration of the liver is a common post-mortem finding in pellagra. Nephritis has not been definitely ascribed to any deficiency, but oedema is a common finding, especially in vitamin-B-complex deficiencies. Gastro-enteritis might be ascribed to the irritant effect of the metal or it might also be a label for the diarrhoea, which would correspond to that which occurs in niacin deficiency.

In the accompanying table I have listed some of the commoner anatomical lesions of deficiency and tried to correlate each with its appropriate biochemical lesion,

Anatomical Lesion of Metallic Poisoning	Biochemical Lesion		Clinical Syndrome
	Enzyme Poison	Vitamin or Factor Deficiency	
Flexural seborrhoea	Arsphenamine, arsenic, gold	Riboflavin	Pellagra, kwashiorkor, pellagra sine pellagra, pink disease, exfoliative dermatitis
Glossitis, stomatitis	Gold, arsphenamine, mercury	Riboflavin, niacin, iron, vitamin B_{12}	The pellagras, sprue, pernicious and aplastic anaemias; gold, arsenic, and mercury poisoning
Encephalopathy (haemorrhagic encephalitis)	Arsphenamine, lead, thallium	Thiamin	Wernicke's encephalopathy, wet beriberi, lead encephalopathy, thallium poisoning
"Peripheral neuritis" (mixed lesion)	Arsenic	Thiamin	Dry beriberi, chronic arsenical poisoning
"Peripheral neuritis" (motor lesion)	Lead	Unknown	Lead poisoning
Hypoprothrombinaemia	Gold	Vitamin K	Neonatal jaundice, purpura of jaundice, purpura of gold poisoning
Alopecia ..	Thallium	? unidentified member of B_2 complex	Thallium therapy of ringworm, kwashiorkor, rickets

whether due to protein poisoning or to factor deficiency. In the last column is given the deficiency and metallic-poisoning syndromes in which the anatomical lesion can be identified. Unintentionally, the table illustrates the confusion caused by the overlapping of various patterns of lesions. It would seem that, with the outstanding exception of lead palsy, all the commoner expressions of metallic poisoning have some counterpart in deficiency diseases.

Theoretically, a "biochemical lesion" can be traced to four possible causes: (1) a nutritional vitamin deficiency; (2) an anti-vitamin effect; (3) a specific anti-protein effect; and (4) a specific protein deficiency conditioned, perhaps, by lack of an essential amino-acid or a breakdown of protein synthesis. Although there is apparently no clear-cut instance of the fourth cause it seems reasonable to claim that in the case of vitamin K the other three possible causes have been realized—a deficiency as in certain cases of neonatal haemorrhage, an anti-vitamin effect as in salicylate therapy and dicoumarol poisoning, and an anti-protein effect as in gold poisoning.

Right from the earliest days in the study of pellagra clinicians have isolated cases with the characteristic epithelial lesions but without the cachexia which goes to make up the complete syndrome of true pellagra. Such cases were given the paradoxical label "pellagra sine pellagra." Sebrell and Butler's (1938) later identification of the syndrome of ariboflavinosis accounted for the vast majority of these cases. Peters's hypothesis should go a long way to account for the rest. It does at least demonstrate the circumstances in which a pattern of deficiency can be manifest in well-nourished patients.

A practical question which arises is whether the "biochemical lesion" is the only toxic effect which we are to expect from current therapeutic preparations of a metal such as gold. Cohen *et al.* (1947), after their successful experience with dimercaprol, have suggested that the use of gold in rheumatoid arthritis can be extended with impunity. It is generally conceded that in the treatment of rheumatism with gold "toxic" cases do best. I have previously suggested (Hughes, 1942) that all agents which are known to be curative in rheumatism have in common a debilitating factor, whether it is a major surgical operation, trauma such as parathyroidectomy or fracture of a long bone, mock operation such as bone forage or mock parathyroidectomy, a debilitating condition such as jaundice (hepatitis), or pregnancy, etc.

The way certainly seems open for higher dosage in chrysotherapy, and it might even seem desirable to aim at a toxic effect. Unfortunately, when the debility is terminated in such cases the rheumatic symptoms recur. The "cure" during pregnancy persists throughout lactation, for example, but it terminates with the onset of the menses (Hench, 1933). A few cases of cure coincident with gold intoxication have already been reported in which relapse followed successful treatment with dimercaprol therapy (Ragan and Boots, 1947; Cohen *et al.*, 1947). Even so, with dimercaprol to fall back upon in an emergency it might be possible to develop a technique in chrysotherapy which would depress the resistance below the level at which the chronic rheumatic lesion can develop.

Summary

Peters's hypothesis of a "biochemical lesion" in metallic poisoning would lead us to expect lesions and patterns of lesions indistinguishable from those which characterize vitamin deficiencies.

The clinical findings in cases of gold, arsenic, mercury, and thallium poisoning are analysed, revealing lesions and patterns of lesions characteristic of vitamin and factor deficiencies.

It is suggested that the hypothesis of a "biochemical lesion" might be stretched to include the possibility of lesions by heavy metals in systems other than the pyruvate–oxidase system.

In the case of "pellagra sine pellagra" and other epithelial patterns of deficiency not associated with obvious malnutrition it is worth while keeping in mind the possibility of metallic poisoning.

The uninterrupted reports of success with dimercaprol in cases of metallic poisoning may encourage the use of higher dosage of gold in the treatment of chronic rheumatism.

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HOSPITAL AND DOMICILIARY CONTROL OF RESPIRATORY TUBERCULOSIS*

BY

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HOSPITAL TREATMENT

The Problem

In certain places visited significant statistical evidence was available of changes in the rates of infection, morbidity, and mortality associated with active anti-tuberculosis programmes. Graphic records of these statistics show a progressive shift of the maximum incidence of infection to the right, or to older age groups. The same is true of active disease and of deaths from tuberculosis. A population which is being infected, which is suffering definite symptoms and succumbing to the disease at a greater age than previously, and in whom this age change is progressive, affords hope for the ultimate elimination of tuberculosis from the community by methods already in use or by factors already operating.

Similar statistical evidence of progress in the United Kingdom during recent years is less reassuring. In some areas, in spite of the general downward trend which is common to many lands, there seems to be a disturbing shift to the left, or to younger age groups, in the mortality figures. Elsewhere a definite increase in the death rate per 100,000 of population has occurred, and the morbidity in some age groups is on the increase in certain localities.

These figures indicate that an intensification of the present measures for controlling the disease is needed and that elimination will require even greater efforts.

Common Measures Employed Against Tuberculosis

A Pure Milk Supply.—Among measures of public health the necessity for an uninfected milk supply is generally accepted. Myers, in Minneapolis, presenting the features of an exceptionally successful control scheme, is emphatic regarding a great fall in the incidence of tuberculin reactions within the general population which accompanied the development of tubercle-free herds in the State of Minnesota.

Apart from general public health reforms, the main features of the anti-tuberculosis campaigns are alike in Scandinavia, the U.S.A., and the Canadian provinces I was privileged to visit. They are:

1. Segregation in sanatoria or tuberculosis hospitals of all persons known to excrete tubercle bacilli in their sputum.
2. Treatment of all cases of active respiratory tuberculosis to the stage of sputum conversion and stability of the disease.
3. Restoration therapy, or "rehabilitation," designed to keep the treated patients in good health.
4. Case-finding by miniature chest *x*-ray surveys.
5. Protection of non-immunes in exposed groups with B.C.G. vaccine.
6. Domiciliary supervision.
7. An economic and social evolution outpacing similar reforms for the general population.

The emphasis on these measures is not uniform and the factors bringing one or other into prominence will be discussed.

1. Segregation of Infectious Cases of Tuberculosis

A sanatorium bed ratio of 2.5 per annual death from respiratory tuberculosis is widely accepted as a minimum in Canada and the U.S.A. Mark, in Minneapolis, claims (personal communication) to make full use of the 4.5 beds per annual death which the reduced incidence of the disease now makes possible. A recent claim for 10 beds per annual death has been advanced by Bogen (1949) as the appropriate measure for elimination of the disease. Scandinavian countries favour a ratio of 3 to 1. The more extreme ratios represent individual views unlikely to be the basis of national policy.

Public Health Law 725 in the U.S.A. laid down that the number of beds required to provide adequate hospital services for tuberculous patients should not exceed, for the purpose of grants-in-aid, two and half times the average annual deaths from tuberculosis in any State over the five-year period 1940–4. Canada and the other countries mentioned intend that beds shall be available, without waiting, for every case of tuberculosis requiring admission, and that indefinite segregation for infectious cases shall be provided.

In the U.S.A. there seems to be considerable evidence of an agreement in policy existing between the major interests in tuberculosis control. The National Tuberculosis Association, the Trudeau Society, and the Tuberculosis Control Division of the U.S. Public Health Service are united in a policy of hospital treatment, to which the allocation of Federal funds has given a great stimulus.

State and city authorities are naturally influenced by the prospects of grants-in-aid for sanatorium construction.

*Extracted from a report to the Nuffield Provincial Hospitals Trust, to whom I am indebted for travel facilities during the spring and summer of 1948.

The grave shortage of nurses and other staff is not considered to be a hindrance to the extensive building programme. In the opinion of the controlling bodies other expedients are likely to be ineffective and may sometimes be dangerous.

The purpose in America is to afford shelter until re-education, restorative therapy, and vocational training—commonly grouped under the heading of "rehabilitation"—are either completed or advanced enough for the patients to be referred to the Department of Labour.

Compulsory Measures.—Although most of the States in the U.S.A. have passed laws making the compulsory segregation of infectious cases possible, there are practical difficulties in their operation. The co-operation of patients is not always secured. The irregular discharge rate from sanatoria for the whole of the U.S.A. is variously quoted, as the statistics are incomplete, but a very conservative figure is 33%, with individual institutions exceeding 55%. It appears that a policy of detention does not achieve its object unless it is supported by a vigorous programme of restoration therapy which gains the co-operation of the patients. In individual sanatoria where these essentials for success did exist the self-discharge rate was as low as 5%. It may be noted that, in order to complete the approved State programmes of sanatorium construction for conformity with the statutory formula, some 80,000 additional beds are still required in the U.S.A.

2. Treatment of Active Disease to the Stage of Stability

Effect of Antibiotics on Bed Requirements.—To the established methods of treatment of respiratory tuberculosis, which include rest therapy, collapse therapy, and environmental therapy, the advent of antibiotics capable of influencing the tubercle bacillus in the human body has added antibacterial drug therapy and excision therapy. The use of streptomycin to render a patient suitable for surgical treatment may reduce the period of preparation by many months, and in some cases routine treatment also may be shortened; but there is likely to be a considerable increase in the demand for surgical facilities and for time-consuming bacteriological and biochemical control. The net effect in reducing bed demands is unlikely to be very great.

Duration of Treatment in Sanatoria.—The provision of beds on the basis of 2.5 per annual death makes possible an average stay in hospital of 14 to 18 months. Converted into maximum and minimum figures, it appears that some 15% of patients, for whom a full programme of restoration therapy is justified, may remain for an average of 2.5 to 3 years. A further 10%, the chronic sputum-positive segregation cases, would continue indefinitely as in-patients, perhaps in somewhat modified accommodation, if they were prepared to accept the restrictions of institution life. The low self-discharge rate from United Kingdom sanatoria compared with American figures is probably due to the differences in bed function and the average duration of stay, which in the former case is limited by the pressure of waiting-lists to less than six months.

3. Restoration Therapy

The term "rehabilitation" is criticized in the U.S.A. because it implies the removal of the patients from the sphere of medical care to the hands of lay officials of the Department of Labour.

It is an aspect of treatment which receives very varied attention. In Norway and Denmark, as too often in England, there is little provision. Sweden has shown considerable initiative both in sanatoria and with sheltered workshops. In certain sanatoria of Canada and the U.S.A. a high standard has been reached.

Much money, equipment, and building space is devoted to restoration therapy in these countries. The logic of this is simple, as some 30% of patients in sanatoria are readmissions who typify the relapsing nature of a disease which is affected by environment. If patients could be kept well after once being restored to apparent stability and working capacity a major source of infection, in the relapsed cases, would be removed from the community and the demand for bed accommodation would be substantially reduced. American opinion is that the disease cannot be controlled without an adequate programme of restoration therapy.

This constitutes the maximum of physical, mental, social, economic, and vocational assistance. The proportion of sanatorium patients who will find their former employment unsuitable varies very considerably in different areas, but may average some 15% of discharges throughout this country.

If the term "restoration therapy" is adhered to in the United Kingdom, and it does correctly define an aspect of medical care, a liberal provision of beds for long-term accommodation will be necessary. In training these patients the education authorities may play a prominent part. The formation of "evening institutes" for class instruction in sanatoria is within their province.

There is need for expansion of sanatorium facilities for such prevocational training.

In Scandinavia and in Canada, where bed accommodation for tuberculosis is available on a more liberal scale than in Great Britain or the U.S.A., the nursing and domestic staff problems also appear to be less acute; but the implications of a full programme of restoration therapy have not received the same amount of attention in the former countries. This is probably owing to the varying degree of industrialization and of rural pursuits in each.

The Cost.—The Veterans' Association in the U.S.A., which is persuaded of the need for keeping patients well as a sound economic proposition, is proceeding with a comprehensive programme of restoration therapy for its ex-Service men at a cost which is stated by Bagley (1948) to be from $0.85 to $1 per patient bed per day in their sanatoria.

EXTERNAL CONTROL MEASURES AFFECTING HOSPITAL BED DEMANDS

The following measures of prevention and aftercare have a direct bearing on the control of tuberculosis. Though regarded in the National Health Service Act as the function of regional hospital boards, their effective use requires the close co-operation of local health authorities, especially in matters of publicity and case-finding.

4. Mass X-ray Surveys

In the countries visited progress has been made in national surveys, and there is agreement that preventive measures should include the detection of all sources of infection. In the past some reliance has been placed upon tuberculin skin tests as a first step in detecting infection in the population, but this is now replaced by miniature radiography of the chest. Mass *x*-ray surveys are regarded by the Tuberculosis Control Division of the U.S. Public Health Service in Washington, D.C., as a springboard for all other measures of controlling the disease. In Scandinavia and in Canada there are many areas in which

20% to 25% of the population over 15 years of age are being *x*-rayed annually. In the United States the Tuberculosis Control Division is sponsoring mass radiography surveys of the larger cities to supplement the local activities of existing services of state, city, and other local agencies.

A pilot survey begun in Washington in January, 1948, was planned to *x*-ray 80% of the people over 15 years of age within six months. When visited in April, 1948, the work was in full swing and the objective seemed to be within reach.

It is proposed to continue similar surveys in all the cities of the U.S.A. with a population exceeding 200,000, and it is hoped that these will be completed within five years.

The Tuberculosis Control Division considers that such case-finding activities, though they may make temporary demands on bed accommodation, will not do so for any long period. Rather, because of early detection, cases require less time in hospital.

In Canada the use of fixed chest clinic units, of portable sets for industrial or other aggregations of population, and of mobile plant is common. The Province of Ontario provides a typical example. In 1947 a total of 232,571 miniature films were taken. The survey included 159 communities and 12 groups such as university and prison populations, treaty Indians, and Civil Servants. A total of 947 cases of pulmonary tuberculosis were detected, or 0.37% of those examined. Of these, 194 were known to have progressive disease and 168 active cases were not previously suspect.

Some question regarding the cost of finding the individual active case by this means is not out of place. The cost, if calculated in that way, is high, and the 54% of inactive lesions found in the Ontario survey suggests that a proportion of the newly found active disease might undergo spontaneous healing. No single feature was more impressive than the educational value of this publicized search for tuberculosis. Familiarity with the tuberculosis services encouraged a co-operative attitude in the ordinary man and woman. In Saskatchewan, for example, local people casually met in public transport talked quite readily of their routine visit to the *x*-ray unit and the check-up on their chests as a matter of course.

Examination of Selected Groups.—Emphasis is placed on the relatively high return of active cases from selected groups such as patients of a general hospital. A well-organized miniature unit of the Royal Victoria Hospital, Montreal, succeeds in *x*-raying approximately 100% of its out-patients. Those attending over long periods are re-examined every six months. Here the abnormalities of all kinds found in chest *x*-ray examinations approximate 2%. Similar arrangements are almost commonplace in the U.S.A. Immigrants to Canada are required to have a miniature film taken before they leave the United Kingdom, and others are similarly examined on arrival in certain provinces. In Denmark a successful attempt is made, with the co-operation of the employers, to *x*-ray all seamen, including fishermen, once yearly. They may not go to sea without a current certificate to the effect that radiography of the chest has excluded evidence of active tuberculosis.

5. Protection of Non-immunes by B.C.G. Vaccination

Experimental Studies in U.S.A.—In May, 1948, the American Trudeau Society's Committee on Chemotherapy recommended its use on non-reactors in exposed and susceptible sections of the population. In the following month Barrett, of the Field Studies Department of the Tuberculosis Control Division, reported investigations on school-children, the effect of vaccinating positive reactors, and the use of freeze-dried vaccine. At a meeting of representatives of public health authorities convened by the Tuberculosis Control Division, Barrett expressed his personal opinion that, if during their course of training 25% of student nurses, tuberculin-negative on entrance, become tuberculin-positive, B.C.G. vaccination is necessary as a protective agent in that hospital.

In the view of Canadians and Scandinavians the protective value of B.C.G. vaccination for selected groups in the community is fully established.

In the U.S.A. a more critical attitude is in evidence with regard to B.C.G. Myers is opposed to its use in the State of Minnesota, where the natural infection rate is so greatly reduced that he regards the tuberculin skin test as an essential weapon in detection which B.C.G. vaccine would nullify.

Considerable publicity is given to Myers's criticism of B.C.G., but in conversation he readily agreed that the vaccine has a definite place in an anti-tuberculosis campaign, except where the infection rate has been successfully reduced by other means.

Scope of Vaccination.—Only in Norway is vaccination for all non-reactors required by law, but in Scandinavia generally the answer to any question regarding means for reducing the bed demands for tuberculosis is "B.C.G. vaccination." Though Canadian vaccination has been on a voluntary basis and in selected groups, it is employed with a thoroughness characteristic of all branches of anti-tuberculosis work in the Dominion.

6. Domiciliary Supervision

Domiciliary supervision as at present practised follows a remarkably uniform pattern in the United Kingdom and in the countries visited. With some notable exceptions there is generally little effective effort on the part of medical staff of health authorities to obtain first-hand information regarding the economic and housing conditions of families in which tuberculosis occurs. Their numbers are limited and they necessarily rely on trained health visitors, either working in tuberculosis alone or with general duties, to assess and report on the home circumstances. Patients attend clinics for supervision and treatment before and after periods in sanatoria. The assistance of social-welfare workers is utilized for the amelioration of social and economic stresses. The patients' own physicians are informed to a variable extent of the course of treatment. The contact cases are sought by health visitors and encouraged to submit themselves for observation at clinics.

Control measures which have effected a significant reduction in the incidence of human tuberculosis share the common factors of generous hospital bed accommodation and case-finding facilities, though the emphasis on other control measures may vary.

If such provision is accepted as necessary, it seems that the essentials for control are not available in the United Kingdom. The claims of tuberculosis in this country for sanatorium accommodation will be considered as part of the overall demand for hospital beds. Numerically the waiting-list of patients suffering from tuberculosis is a small part of the total requiring admission to hospitals for all forms of illness; but the average length of treatment is necessarily much greater.

To provide accommodation equivalent to 2.5 per annual death from respiratory tuberculosis in this country a

further 30,000 sanatorium beds, with staff accommodation and the necessary personnel, also 30,000, would be required.

Though hospital building may be delayed there is not the same objection to early recruitment of staff and a serious attempt to add their number to those already employed in home supervision and treatment. The possibilities of this would be affected by varying degrees of urbanization and industrialization, but wherever feasible the personnel and facilities for home treatment of selected cases might be considered by regional hospital boards and local health authorities in conjunction.

Such a change in emphasis on home treatment has had serious consideration for many types of long-term illness in the pioneer work of the Montefiore Hospital, in New York City, which began in January, 1947. A striking feature of this successful project has been its relative economy, the cost per day to the hospital being only 25% of in-patient treatment.

Other interests have been stimulated to plan on similar lines, and the progress of pilot schemes in the cities of New York, Newark, N.J., Richmond, Va., San Francisco, and Montreal deserves close attention, not only with regard to the care of long-term illness in general but because of the lessons they may provide for the home treatment of tuberculosis.

7. An Economic and Social Evolution

Evidence is available of the adverse effect of defective nutrition on the tuberculosis death rate. An upward trend of the tuberculosis mortality figures of certain age groups during recent years has been noted in the industrial north of Great Britain, though the factors operating are not clearly discernible.

Rehousing of families to provide a separate bedroom for the affected member and to avoid overcrowding of the remainder is a common feature of public health authorities' work both at home and abroad.

Economic security, as well as adequate nourishment, is a recognized element in programmes of control; but the amount of assistance and the desirable level of security relative to that of the average wage-earner are not scientifically estimated.

In the home workshops and the sheltered industries of Stockholm, the Altro factory of New York City, and the successful schemes of the United Kingdom there are pointers of which the implications are recognized in the Disabled Persons (Employment) Act, 1944.

Summary

There are certain measures common to programmes for the control of respiratory tuberculosis, of which case-finding facilities and adequate bed accommodation are prominent features in successful schemes.

The other main features of anti-tuberculosis campaigns are described.

The present specific measures for the control of tuberculosis in the United Kingdom are not sufficient to accelerate the natural downward trend of mortality rates.

There are deficiencies in the numbers of hospital beds and staff and also in case-finding facilities.

Respiratory tuberculosis, though it has strong priority claims on institution accommodation and personnel, will receive only a percentage allocation of beds in the foreseeable future.

There is some evidence of the practicability and the economy of home treatment, under certain circumstances, of long-term illness from which respiratory tuberculosis need not be excluded, provided staff and equipment are made available for the purpose.

It is important to assure by adequate measures of rehabilitation that successfully treated cases stay well.

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CORAL ULCER

BY

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The seven cases described in this paper occurred among officers and ratings of H.M.S. *Challenger* during a survey of the eastern seaboard of Qatar Peninsula, in the Persian Gulf, during the months of January and February, 1949

The name "coral ulcer" is given for want of a better one. Little can be found in the literature on the subject, though the condition is well known among the fishermen and pearl divers of the western seaboard of the Persian Gulf and occurs among the fishermen of Ceylon also Wyville Thomson, in his *Scientific Reports on the "Challenger" Expedition, 1872–1876*, reports the condition briefly, but says little except to advise the wearing of stout boots on coral reefs. Paradice (1924), a member of the 1924 Great Barrier Reef expedition, gives a good description of the condition and discusses treatment. Byrne (1924) reports the condition in Japanese pearl divers and in bêche-de-mer lugger crews working out of Thursday Island, as well as in himself and ratings of the Royal Australian Navy Levin and Behrman (1941) report a case in the West Indies and discuss treatment with *x* rays. Bonnevie (1948) describes "Dogger Bank itch," which is caused by a coralline similar in some ways to the tropical corals.

Clinical Features

The patient first complains of lacerations of the feet, legs, or hands after contact with living coral reefs. In some cases the lacerations may pass unnoticed or be so minute as to escape attention, or may even be absent.

Some 12 to 24 hours later he begins to complain of pain in the injured area. This is fairly severe, especially on walking. In a few hours a spreading area of cellulitis appears around the wound. The laceration gapes and discharges a thin grey serous pus. The course is slow and painful, and deep ulcer formation is inevitable. It is accompanied by cellulitis, lymphangitis, enlargement of the local lymphatic glands, and (rarely) fever and malaise. The ulcer is as a rule disabling and the pain quite out of proportion to the physical signs. The patient is often unable to walk for weeks or months after the injury, especially if it is on a weight-bearing area. The course is punctuated by sudden relapses, when the condition flares up again without warning.

The Coral Polyp

To appreciate the aetiology and treatment of the condition an attempt must be made to study the location, life-cycle, and habits of the individuals that make up these large colonies or reefs.

Corals, except in their embryo state, are sessile creatures living in large colonies and feeding on small motile marine organisms which they capture by means of a specially developed mechanism. They live in the warm waters of the world, a sea-water temperature of 60° F. (15.5° C.) being necessary for their survival. The colonies exist usually near the surface, but deep-sea types are known. They secrete a hard calcareous shell around themselves by precipitating calcium from sea-water—an action performed by the individual polyps. The skeletons join up to form the mass of the colony, and eventually a reef is formed which remains many years after the death of its contained polyps.

The polyp has both sexual and asexual methods of reproduction. In the sexual form the union of germ cells results in a free-swimming ciliated planula larva about 1 mm. in length. The planula, though lacking the mouth and enteron of a typical larva, may live on yolk food for periods long enough to bring about considerable dispersion. This is typical of all corals and anemones. Vaughan found in 1919 that the pelagic period of corals was between one day and three weeks. On settling on a hard bottom, the planulae develop mouths and tentacles for feeding, and shortly afterwards the organs for reproduction are formed.

In the asexual form there is simple fission—formation of daughter cells by budding—and the development of a large colony is thus initiated from one individual. The skeletons of these asexually produced individuals form large sponge-like coral heads, some of them extending to as much as three metres in diameter and containing many thousands of polyps. In four years a new colony will reach a diameter of 50 mm.

The feeding mechanism of the polyp is interesting and demands special attention. The adult polyp, being a sessile creature, so to speak "moored" to its skeleton and joined to its sisters in the reef or head, has developed a special feeding mechanism for capturing and digesting its prey. The diet consists largely of small motile marine organisms which abound in their thousands over the reefs.

Like the medusae of the Obelia class, the polyp has specially adapted ectodermal cells called nematocysts containing a coiled thread which ends in a dart-like silica head. This head contains a fluid of considerable physiological effect which has an action not unlike that of cantharides. The whole apparatus is developed in an interstitial cell called a cnidoblast, which, as it reaches maturity, migrates towards the surface of the polyp and at one point is elongated into a delicate process—the cnidocil, or trigger hair. When the cnidocil is broken by a passing organism or body the dart is ejected with considerable force from the cnidoblast into the body of the victim, where the released toxic fluid, rapidly spreading, causes complete paralysis, enabling the polyp to grasp the victim in its tentacles.

Certain types of these animals like the medusae can penetrate normal human skin; this is also seen in the sea-anemones of the genus *Hellenpolypus* and *Actinia*. The Portuguese man-of-war (*Physalia*), too, can penetrate human skin.

In the case of corals, however, the darts are probably shot into the open lacerations sustained concomitantly through contact with the calcareous skeletal mass of the colony. Minute puncture wounds of the feet and legs may pass unnoticed, but where they occur on living coral the chances of penetration by these minute bodies, or even by small broken-off fragments of coral, are greatly increased. There is therefore a distinct possibility that the contained "physiological fluid" is released in open coral cuts or under the skin. The effect of this fluid in susceptible persons is considerable and may produce shock and collapse, together with considerable local irritation.

Case Reports

Case 1.—A lieutenant aged 26 sustained a puncture wound of his right heel while walking across a reef. When he returned to his ship six days later there was a closed puncture wound 1.2 cm. in diameter over the ball of the right heel covered by a thin scab. The wound was surrounded by an area of cellulitis 5.2 cm. in diameter and there were several tracks of lymphangitis on the lateral aspect of the foot and lower leg. The inguinal glands were not tender or enlarged. The whole area was very tender and acutely painful on walking. There was no evidence of underlying pus. Rest, poulticing, and penicillin (three doses of 200,000 units six-hourly) were prescribed. Twenty-four hours later the wound was excised and a small amount of grey serous pus obtained, which on culture gave pure colonies of *Staphylococcus albus*. Seven days later he suffered a relapse, and a second ulcer broke out on the lateral aspect of the foot. The ulcers were curetted on alternate days with a Volkmann spoon. The primary ulcer now measured 1.5 cm. in diameter and 1 cm. in depth, the muscles of the foot being visible in the base. The ulcer of the lateral aspect was 2 cm. in diameter and 1 cm. in depth; a small piece of coral was obtained from this ulcer. *X*-ray examination revealed no other foreign bodies of macroscopic size. The condition slowly resolved, but the patient was absent from duty some 51 days in all. Weight-bearing was painful at first, but once the scars were sound he was able to walk on the affected foot.

Case 2.—An able seaman aged 19 got three coral puncture wounds of both ankles around the medial and lateral malleoli while wading ashore. On return aboard 14 days later the two medial wounds of his right leg were covered with thick scabs and seemed to be in an advanced stage of healing. The lateral wound of his right leg was 0.8 cm. in diameter and 0.5 cm. in depth; this was painful on pressure and from it oozed a grey sérous pus. There was no evidence of cellulitis. Culture revealed pure colonies of *Staph. albus*. After five days' treatment with magnesium sulphate dressings and elevation of the limb the patient was returned to full duty with the ulcer apparently healed. Four days later he returned from a detached survey with the ulcers of both legs broken down. Complete rest in bed with elevation of the limb was ordered. Full excision of the ulcers was performed and dressings of magnesium sulphate in glycerin solution were applied six-hourly. Between dressings the feet were bathed in eusol. Penicillin. 200,000 units intramuscularly, was given six-hourly. The ulcers healed rapidly, there has been no recurrence, and the scars were sound. In all, the patient was absent from duty for nine days.

Case 3.—An able seaman aged 22 sustained an incised wound of the pulp of the left hallux while walking barefoot over a coral reef. Four days later the toe was swollen and painful and the whole area was red and tender. A wide incision was made which discharged thin grey serous pus. On culture this gave pure colonies of *Staph. albus*. Kaolin poultices were applied six-hourly and the cellulitis disappeared in 24 hours. The wound was then dressed with magnesium sulphate in glycerin solution six-hourly. In three days the condition was almost completely healed and the patient returned to full duty. A sound and painless scar was obtained.

Case 4.—An able seaman aged 37 sustained four puncture wounds of the lateral malleolus of his right ankle on a reef. They were about 0.5 cm. in diameter and 0.2–0.5 cm. in depth. When seen 10 days later there was considerable cellulitis of the area and a few streaks of lymphangitis on the lateral aspect of the lower leg. All the ulcers were discharging a thin grey serous pus. Treatment consisted in poulticing for 36 hours

followed by magnesium sulphate and glycerin dressings for six days. The condition rapidly subsided.

Case 5.—A lieutenant aged 22 received numerous coral wounds of both feet. Examination three days later revealed six puncture wounds of the soles, heels, and toes of both feet. All the wounds were closed and were surrounded by areas of cellulitis which were extremely tender on pressure. Culture of pus gave pure colonies of *Staph. albus*. It was necessary to incise many of the ulcers, as there were signs of underlying pus, which was scanty and serous. Magnesium sulphate in glycerin solution was then applied. The patient was also given a 30-g. course of sulphathiazole and 400,000 units of penicillin intramuscularly. The condition rapidly healed, and he was discharged to duty 14 days after reporting sick. He was ambulant throughout treatment. One month after discharge he sustained a fresh coral puncture wound of the lateral aspect of the right ankle. This ulcer was discharging a grey serous pus. It measured 0.5 cm. in diameter and 0.3 cm. in depth, and was surrounded by an area of cellulitis 5 cm. in diameter. Treatment was by applications as in the other cases. The condition cleared up rapidly. Culture of the pus obtained gave pure colonies of *Staph. albus*.

Case 6.—An electrician's mate aged 20 sustained a coral puncture wound of the lateral aspect of the right ankle 14 days before being examined. On examination there was a circular ulcer about 0.8 cm. in diameter and about 0.5 cm. in depth, posterior to the lateral malleolus of the right leg. There was a large surrounding area of cellulitis and tracking lymphangitis of the lateral aspect of the leg. The ulcer was extremely tender on pressure, but was closed over by a thick scab. There were no signs of underlying pus. The area was poulticed with kaolin six-hourly for a period of 24 hours, when it became apparent that there was underlying pus. The scab and surrounding skin were excised and a small collection of grey serous pus was released. Penicillin, three doses of 200,000 units, was injected. The patient returned to duty five days after the beginning of treatment. A sound scar was obtained.

Case 7.—A leading seaman aged 21 received numerous coral puncture wounds of both ankles three days before examination. All were septic and discharging a thin grey pus. Several of the wounds were surrounded by small areas of cellulitis, but none was severe. There was no evidence of lymphangitis. Treatment was by magnesium sulphate and glycerin dressings. The patient was discharged to full duty two days later. A sound scar was obtained in each lesion.

Conclusions

It seems that silica-headed darts released by the cnidoblast cells of the coral polyp enter into the wounds or under unbroken skin. It is possible that small pieces of coral containing many polyps may be introduced into the wound.

These darts release a toxic fluid which is capable of producing complete paralysis in small marine animals. This fluid almost certainly irritates human tissues. At the same time the silica-headed darts produce a foreign-body reaction which results in hyperaemia in the area as well as the pouring in of leucocytes.

The wound is invaded by secondary infectors—that is, the normal inhabitants of the skin, *Staph. albus*. This was the only organism isolated from the ulcers.

Byrne suggests that a deficient diet aids the formation and delays the healing of coral ulcers. In my series all personnel were living on a standard diet with a daily average intake of 3,600 calories. At the same time they had ample supplies of fresh vegetables and the vitamin intake was supplemented by compulsory rations of lemon juice and canned fruit. Except for those suffering from coral ulcer, the members of the survey party returned to the ship in a much fitter state than when they left to go ashore. They had facilities for regular daily exercise denied to those left aboard, lack of recreational space being severely restricted in a small ship.

Byrne also suggests that the intake of alcohol may delay healing and may be a factor in producing the condition. The patient in Case 1 was almost a teetotaller, and Case 2 was under age and unable to draw his "tot" of rum. These cases were the most severe of the series and both required treatment in bed. The climate seems to have had little effect, as the two months in question—January and February—are the coolest in the Persian Gulf.

Coral ulcer would probably be prevented by the provision of special protective footwear (the present jute-soled coral shoes are entirely inadequate) and by the education of personnel in the dangers of the condition.

Summary

The condition "coral ulcer" is discussed with reference to its occurrence among officers and ratings of H.M.S. *Challenger* during a recent survey in the Persian Gulf. The life history of the coral polyp is discussed and its peculiar feeding mechanism described. Seven cases of the condition are reviewed and their aetiology, course, and treatment described. The need for efficient coral shoes is emphasized.

I am indebted to Mr. R. M. Ramsden, resident geologist, Petroleum Development (Qatar) Ltd., Dukkan, Persian Gulf, for tracing the life history and feeding habits of coral; to Dr. G. F. N. Anderson, senior medical officer of the same company, for notes on cases; to Mrs. Hills, bacteriologist, Bahrain Government Hospital, who performed all the bacteriological work; to Mr. T. J. Shields, librarian of the British Medical Association, who searched the literature on the subject and dispatched all his notes to the Persian Gulf by air; to Lieutenant D. A. Wiltcher, R.N., for notes on the coast of Qatar; to Sick-berth Attendant E. Owens, of H.M.S. *Challenger*, for treating the cases; and to the Medical Director-General of the Navy for permission to publish this paper.

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The United States Army's health was better in 1949 than it had ever been, said Major-General R. W. Bliss, Army Surgeon-General, recently. "The U.S. Army to-day is not only the healthiest army in the world, but the healthiest in all history." He gave figures to show that the rate of admissions for 1949 was 128 per 100.000 strength per average day. "Admissions" includes not only hospital patients but also all persons relieved from duty because of illness or injury beyond the day of onset. The 1949 report shows an improvement in Army health for the fourth consecutive year since the end of hostilities, and compares favourably with an average wartime rate, excluding battle casualties, of 202 admissions per 100,000 per day. Since then there has been a steady decline, the average daily rate being 178 in 1946, 174 in 1947, and 132 in 1948. The Army report includes rates for the Air Force for the first half of 1949, as well as for the Army for the entire year. The Air Force set up its own medical service last July, and began its own system of health reporting then. General Bliss referred also to a consistent decline in the death rate, particularly in deaths from disease. The 1949 figures for total deaths were 200 per 100.000 strength per year, against 220 for 1948 and 230 for both 1946 and 1947. There were 50 deaths from disease per 100,000 per year in 1949, 60 in 1948, 70 in 1947, and 80 in 1946.

FERROUS SULPHATE POISONING

ITS INCIDENCE, SYMPTOMATOLOGY, TREATMENT, AND PREVENTION

BY

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In a pathological report on a case of ferrous sulphate poisoning admitted to my ward Prain (1949) describes the lesions, with their probable toxic significance, and the risk that these attractively coloured pills entail when young children have access to them. An annotation in the *British Medical Journal* (1949) emphasizes this risk and points out that all the recorded cases have occurred in Scotland and the northern half of England. Another case has in fact occurred in Surrey (*Surrey Comet*, 1949). It has accordingly seemed worth while to review the experience of this one hospital unit, which serves Dundee, with a population of 182,000. All the cases came from Dundee and no others are known to have been admitted elsewhere in the city. The first case occurred on May 3, 1944. This is the earliest case known to have been recorded in modern times. It was fatal, and along with the second case, which occurred on March 4, 1947, has already been fully reported (Thomson, 1947).

Six cases have occurred in the period from May 3, 1944, to October 2, 1949, and have all been under my care in Dundee Royal Infirmary. All took similar tablets containing ferrous sulphate exsic. 3 gr. (0.2 g.), copper sulphate 1/25 gr. (2.6 mg.), and manganese sulphate 1/25 gr. (tab. ferrous sulph. co., *B.P.C.*).

Case 1 (Summary of Report)

On May 3, 1944, a 16-months-old girl took 40 ferrous sulph. co. tablets from a paper packet and swallowed 39 of them at 10.30 a.m. She was given salt and water to drink and returned 13. Thus 26 were retained. She became hot and drowsy, and kept on coughing and vomiting. The vomit contained blood-stained material. On admission at 11.50 a.m. she was drowsy, pale, and still coughing and vomiting. The temperature was 96° F. (35.6° C.), pulse 140, and respiration 24. The pulse was of slightly diminished volume. The abdomen was slightly distended, but there was neither tenderness nor resistance on palpation. In the evening she was breathing heavily but was otherwise comfortable. No further vomiting occurred, but one loose stool containing mucus and dark blood was passed. At 7.30 a.m. on May 4 (21 hours after taking the tablets) her temperature rose suddenly, breathing became difficult, and the child became cyanosed. She appeared to choke on inspiration and died at once.

At post-mortem examination Dr. G. H. Smith found intense inflammatory change in the gastric mucosa and a marked degree of necrosis and sloughing limited to the crests of the longitudinal rugae. The necrosis extended down to muscle. In contrast to the stomach there were only a few patches of congestion in the upper jejunum. The intestine was otherwise healthy.

Treatment.—She received salt and water to drink before admission, and on admission gastric lavage with a sodium bicarbonate solution was carried out. Normal saline was left in the stomach, and 2½ gr. (0.16 g.) of bismuth carbonate was given four-hourly, and sodium bicarbonate 15 gr. (1 g.) at 8 p.m. She was also given glucose and orange juice, and later diluted milk.

This child died after retaining about 26 pills in spite of what, in view of subsequent investigations (Somers, 1947), seems to have been the correct treatment with bicarbonate solution to dilute the corrosive iron and also to reduce its solubility by altering it to the less irritant ferrous carbonate.

Case 2 (Summary)

On March 4, 1947, at about 9.30 a.m., a boy aged 2 swallowed about 10 tablets similar to those in Case 1. Approximately half an hour later he began to vomit, and two tablets were returned whole. There was no haematemesis. His appearance became "waxy," but improved before he was admitted at 2.5 p.m. the same day. On admission he was flushed and drowsy, and there was neither abdominal tenderness nor abnormal resistance on palpation. A stool passed later in the day gave a positive guaiac reaction. Vomiting ceased by March 6 and the stool was normal by the 9th with no blood. On the 13th the guaiac test was again positive; no meat had been given. Further recovery was uneventful.

Treatment.—He was given ½ oz. (14 ml.) of mist. magnesium hydroxide on admission and bismuth bicarbonate 2½ gr. four-hourly along with glucose and water, later changed to milk and subsequently to milk diet.

Case 3

On July 6, 1947, a girl aged 4½ years swallowed about 24 tablets. An hour later, according to her mother, she vomited about 20 of them. On admission she was slightly pale. Her abdomen was normal on palpation. She received 2½ gr. of bismuth carbonate four-hourly, but never exhibited any symptoms of illness except the vomiting before admission. According to the history she returned 20 tablets in recognizable shape one hour after swallowing them.

Case 4

On February 8, 1948, a girl aged 11 months was admitted under my care. A full report of this case has been published by Prain (1949). A summary of the case is given here.

At 7.30 p.m., while playing with a box of these tablets prescribed for her mother, she swallowed an unknown quantity of them and became drowsy and vomited. On admission at 9.30 p.m. she was pale and drowsy; the abdomen was soft and not tender. She vomited altered and bright-red blood until 10 p.m., when vomiting ceased. Next day she seemed well and played with her toys. She passed two tarry stools. But on the morning of the 10th she became cyanosed and had moist accompaniments at both bases. She died 39 hours after taking the pills.

On post-mortem examination extreme congestion of the mucous membrane was found; but the necrosis, though locally severe, was not so striking as in Case 1. The small intestine shows a few areas of congestion less marked than in the stomach.

Treatment.—This consisted of gastric lavage with sodium bicarbonate in water, also bismuth bicarbonate 2½ gr. in mist. cretae four-hourly.

Case 5

On July 14, 1949, a boy aged 19 months took some tablets off a shelf and was found eating them. He probably ate about 10. Before admission he was given syrup of figs and then salt and water, after which he vomited brown fluid several times. There was no red blood in his vomit. He then went to sleep, and was admitted 1½ hours after taking the tablets. A stool examined on the 16th gave positive reactions to Kastle-Meyer and benzidine tests for blood. Recovery was uneventful.

Treatment.—Gastric lavage with sodium bicarbonate produced clear fluid with streaks of blood-stained mucus in it. On the 14th dimercaprol, 0.5 ml., was given four-hourly for a few doses, but was stopped on the 15th.

Case 6

On October 2, 1949, a boy aged 2½ years was discovered at 8 p.m. with his mouth full of tablets which had been supplied to his mother. The quantity he ate is not accurately known, but was probably between 10 and 20. He was given syrup of figs at home, and vomited at 8.15 p.m.; subsequently he vomited five more times. The first five vomits contained "white bits and green stain." The last vomit contained only "water." He complained of a sore stomach after swallowing the pills, and was drowsy at 9.30 p.m. He was admitted at 11 p.m. awake but sleepy. His abdomen was soft and not tender. Gastric

	Age and Sex	Tablets Taken	Tablets Returned After Interval of	Tablets Retained	Treatment Before Admission	Time Before Admission	Treatment After Admission	Early Pallor	Drowsiness	Vomiting	Abdominal Pain	Haematemesis	Guaiac or Kastle-Meyer or Benzidine Test	Sudden Collapse	Result
1	16/12 M	39	13; less than 1 hour	26	Salt and water	1 hr. 20 mins.	Soda bicarb. lavage, bismuth carb.	+	+	+	−	+	+	+	Died
2	2 yrs. M	10	2; ½ hour	8	Water freely	4½ hrs.	Mist. magnes. hydrox. and bismuth carb.	+	+	+	−	−	+	−	Recovered
3	4½ yrs. F	24±	20; 1 hour	4	None	?	Bismuth carb.	+	+	+	−	+	−	−	,,
4	11/12 F	?	None	?	None	2 hrs.	Soda bicarb. lavage, bismuth bicarb., mist. cretae	+	+	+	−	+	+	+	Died
5	19/12 M	10±	None	10±	Syrup of figs; salt and water emesis	1½ hrs.	Soda bicarb. lavage, dimercaprol	−	+	+	−	+	+	−	Recovered
6	2½ yrs. M	10–20	Fragments, less than 3 hours	?	Syrup of figs	3 hrs.	Gastric lavage ½ oz. mag. sulph.	−	+	+	+	−	−	−	,,

lavage was carried out with saline, and ½ oz. (15 g.) of magnesium sulphate in solution was left in the stomach. On the 3rd and 4th he passed two loose dark stools each day. The guaiac and Kastle-Meyer tests were negative. His further recovery was uneventful.

Discussion

Textbooks differ in their statements about tests to distinguish iron from haemoglobin. Tests showed that the Kastle-Meyer and benzidine tests give a brown deposit with iron solutions quite distinct from the colour reactions with haemoglobin. The guaiac test, while distinguishing between the two, does not give such obviously contrasting reactions.

So far as is known no other cases have occurred in Dundee in this period of 5 years and 5 months.

It thus appears that the condition is not rare. No explanation for the known cases occurring in the more northern parts of Britain can be offered except the accident of reporting.

The clinical picture of these cases is pallor at an early stage, followed by drowsiness, and vomiting early but ceasing after a few hours. Abdominal pain was noted in only one case, while none had abdominal tenderness or abnormal abdominal resistance. Haematemesis may be severe and early or not be clinically evident. Blood is probably present in the stools in most cases. A most misleading period of well-being, even playfulness, was seen in Cases 1 and 4 and in Forbes's (1947) first case. This was followed by fatal collapse. An important point is that whole tablets or fragments of them may persist in the stomach for at least one hour. Emesis in addition to lavage is therefore important for prompt elimination of any iron still in pill form.

The treatment given to Case 1, and subsequently experimentally justified by Somers, seems to have been appropriate—namely, gastric lavage with an aqueous bicarbonate solution to convert as much as possible of the corrosive ferrous sulphate to the much less irritant ferrous carbonate and to dilute it. Also to get rid of pills by emesis, which has been successfully done half an hour to one hour after ingestion; then to protect the mucosal lesions by bismuth. This seems to be the rational method of attempting to prevent the delayed sudden fatal collapse occurring after a deceptive period of improvement. This collapse is possibly due to toxic absorption from damaged mucous membrane affecting the liver (Prain, 1949). Dimercaprol, although tried, did not appear to help, and it is now suggested that it may be harmful (Edge and Somers, 1948).

It is abundantly clear that prevention of this accidental poisoning is important and urgent. The makers of "fersolate" tablets have now added a warning: "Excessive doses of iron can be dangerous. Do not leave these tablets within reach of young children, who may eat them as sweets with harmful results." They also supply the tablets in a screw-topped container which would baffle the younger children. Welfare and antenatal clinics in particular should review their methods of issuing the useful ferrous sulphate tablets to adults. They should never be issued in paper packets or a carton with a loosely fitting lid. However, children on occasion will exercise much perverse ingenuity. One boy, aged 6½, obtained and swallowed a poisonous quantity of pills containing iron, arsenic, aloin, strychnine, and capsicum by raiding a drawer in his friend's aunt's house.

The hope expressed in an annotation in the *British Medical Journal* (1947) that recognition of the danger would secure adequate precautions has not been realized. It would seem to be urgent that administrative action should be taken now to prevent these useful tablets being dispensed in unsafe containers, and that adequate warning be given on the containers of their potential danger to children when ingested in excessive quantity, as happens when children regard them as sweets. They should also be stored in a really safe place. It is considered insufficient to make them a less attractive colour, as the pleasant taste of the coating would still appeal to children and cause them to continue to suck and swallow more pills. I wish to oppose the suggestion (*Lancet*, 1949) that these very useful pills should be withheld from adults where there is a young family.

Summary

Six cases of ferrous sulphate poisoning are reported occurring in 5 years and 5 months in a town with a population of 182,000. Two patients died and four recovered. Early pallor, drowsiness, vomiting, haematemesis, and later melaena were the main symptoms. Fatal collapse may follow apparent recovery. The treatment given is described and discussed. An urgent plea is made for administrative action to secure really safe packing and storing of these pills when dispensed. Ferrous sulphate is so valuable when properly employed that it is important to prevent undeserved unpopularity due to the gross abuse of it. Gross abuse is a fair description of its use in the present series of cases.

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LIVER FLUKE IN THE COMMON BILE DUCT

BY

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Liver-fluke infestation in man has been recorded in fewer than 50 cases in Europe (Stitt, Clough, and Clough, 1939), and in only two reported cases has a liver fluke been surgically removed from a common bile duct. We have therefore thought it worth while to report three cases in which the liver fluke was found in the common bile duct at operation. Two of these occurred in Bath and one in Plymouth, and all within the last decade.

Case Reports

Case 1.—A married woman aged 50 was admitted to the Royal United Hospital on May 12, 1939. She complained of flatulence and attacks of epigastric pain for over ten years. A few weeks before admission she had a typical attack of gall-bladder colic followed by jaundice which lasted for two weeks. Laparotomy was carried out on May 15. The gall-bladder was distended and contained a few small stones; the common bile duct was greatly dilated, and on opening it three liver flukes and some biliary mud were removed. Post-operative convalescence was normal, and the patient was discharged home after 14 days. Unfortunately we have been unable to trace her subsequent history. The pathologist reported that the liver flukes were typical *Fasciola hepatica*. No eggs were seen in the bile or faeces collected after operation. A white cell count taken three days after operation showed a mild leucocytosis but no eosinophilia.

Case 2.—A married woman aged 50 was admitted to the Royal United Hospital on May 30, 1947. For three years she had complained of epigastric pain and flatulence. On one occasion after a severe bout of pain she had been slightly jaundiced. A cholecystogram showed good dye concentration and normal contraction of the gall-bladder after a fatty meal. On June 5 laparotomy was carried out. The gall-bladder was found to contain stones, and the common bile duct was dilated and inflamed. The liver was of normal size and appearance. On opening the bile duct one liver fluke was removed together with muddy bile but no stones. The gall-bladder, which contained a few pure pigment stones, was removed. The fluke was again typical *F. hepatica*. A white cell count taken two days after operation showed a mild leucocytosis but no eosinophilia. No eggs were seen in the bile or faeces collected after operation. Convalescence from the operation was uneventful, and the patient was last seen on August 25, 1947, when she was feeling quite fit and had no flatulence. Her blood count was then normal. This patient volunteered that she was very fond of watercress.

Case 3.—A married woman aged 58 was seen at Plymouth on October 31, 1948. For four years she had had intermittent attacks of severe right subcostal pain. The attacks occurred each day, and she suffered from flatulence. Her appetite was poor, she had lost a considerable amount of weight, and was constipated. In May, 1948, she had passed a tarry motion. Laparotomy was carried out on November 5 by Mr. Wilson, of Plymouth. The gall-bladder was opaque and thickened, and a mass was felt in the region of the pylorus that seemed to be a posterior duodenal ulcer. The liver was normal. The dilated common bile duct was opened and explored, and a few specks of biliary mud followed by a large liver fluke were evacuated. The liver fluke measured 15 by 8 mm. Posterior gastro-enterostomy, cholecystectomy, and appendicectomy were performed and the common bile duct was drained. The gall-bladder was thickened but contained no stones. The patient made an uneventful post-operative recovery and was last seen on November 29, 1948, when she was in good health and was putting on weight.

Discussion

The liver fluke (*F. hepatica*) normally lives in the bile ducts of sheep and cattle, where it produces biliary cirrhosis—a disease known in sheep as liver-rot.

An essential part of the life history of *F. hepatica* has to be spent within the little water-snail (*Limnaea truncatula*), so that faeces must be dropped on wet land if the larvae are to be taken up. Animals and man are infected by ingesting larvae which have left the dying water-snail and encysted themselves on blades of grass or watercress leaves. Liver-fluke disease in sheep and cattle is widespread in Western Europe and in this country, and its incidence is favoured by undrained pastures and wet seasons.

In most previously recorded cases in man the disease has been characterized by irregular pyrexia, rigors, and anaemia. Some cases have had upper abdominal discomfort suggestive of cholecystitis, but jaundice has been rare. Blood examination usually showed a marked leucocytosis and eosinophilia, and the diagnosis was made by finding ova in the faeces. In contrast to such cases, which have obviously been heavily infested, the cases here reported showed no severe constitutional upsets, and there was nothing in the symptoms or pathological findings to suggest parasitic infestation. The operations were carried out for chronic cholecystitis, and the liver flukes were found only because a dilated common bile duct necessitated exploration.

It seems possible that the incidence of liver fluke in the common bile duct may be much commoner in this country than is generally realized; and the occurrence of a fourth case in the West of England recently reported (O'Donnell, 1949) with similar clinical and operative findings supports this contention.

In none of these cases was a diagnosis made before operation, but in each case, including Walton's, a dilated common duct was found in the absence of jaundice. We think, therefore, that this finding should suggest the possibility of the presence of a liver fluke in the common bile duct.

We are grateful to Mr. Edric Wilson, of Plymouth, for his kindness in allowing us to include his case.

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Under the Nurses Act (Northern Ireland) of 1946 the statutory restriction in Northern Ireland on the use of the title "Nurse" came into effect on March 16. The statutory requirements for the licensing of agencies for the supply of nurses also operates. The Act reserves the title "Nurse" for use only by persons who are either State-registered or enrolled assistant nurses, but the regulations will permit other persons who have certain nursing qualifications or nursing experience to use the title. From March 16 it became an offence for any person to conduct an agency for the supply of nurses otherwise than in accordance with the statutory requirements. Such agencies must be duly licensed by the Ministry of Health and Local Government.

Medical Memoranda

Synchronous Double Primary Carcinomata

The frequency of multiple primary malignancy has been variously estimated by different authors; in general it would seem to be between 2 and 5% of all cases of cancer. Figures from eight of the more important series are shown in the table.

Author	No. of Necropsies	No. of Malignant Cases	No. Multiple Malignant
Hanlon	3,000	950	18 (1·9%)
Bilello	8,024	1,154	7 (0·5%)
Bugher	4,394	983	30 (3·1%)
Austin	8,124	887	24 (2·7%)
Burke	2,033	583	46 (7·8%)
Tullis	6,836	1,044	21 (2·0%)
Warren and Gates ..	—	1,075	40 (3·7%)
Warren and Ehrenreich	—	2,829	194 (6·8%)

The following two cases are of interest as they are both synchronous double carcinomata, each showing greatly contrasting histological pictures.

CASE 1

A man aged 61 was admitted to hospital on September 5, 1947, with a six-months history of diarrhoea and the passage of blood and mucus, occasional pain on defaecation, with lack of control and excessive flatus, and some loss of weight. There were no symptoms referable to the genito-urinary system.

Physical examination revealed general wasting. On rectal examination a large irregular ulcer was found above the prostate. The latter organ was rather hard and large. The liver and supraclavicular glands were not palpable. Cystoscopy showed the bladder to be normal. A synchronous abdomino-perineal excision of the rectum was performed on September 19, but the patient died ten days later.

Summary of Necropsy Findings.—A mild generalized peritonitis with soft adhesions between the viscera. No fault in the operative sites. No residual growth in the intestines or in the regional lymph nodes. Serial sections through the liver showed a single deeply placed spheroidal metastasis (3.5 cm. in largest diameter). In view of this finding, the lymph nodes alongside the aorta, though macroscopically normal, were taken for histological examination. Moderate general enlargement of the prostate, which was firm and contained a few white areas. Congestion of the bladder; hydronephrosis on the right side. No significant changes elsewhere. The surgical specimen (50 cm. long) presented a carcinomatous ulcer (10 by 7 cm.) with its lower margin 6 cm. from the recto-anal junction.

Histology.—Rectal primary:—A well-differentiated tall columnar-cell tubulo-papillary adenocarcinoma, with a metastasis of similar type in one local lymph node. *Liver metastasis:*—Similar in structure to the rectal primary. *Prostate:*—An adenocarcinoma composed of small simple tubules formed by low cuboidal cells about a wide lumen was infiltrating the gland. *Aortic lymph nodes:*—Deposits of secondary adenocarcinoma, unlike the rectal growth but reproducing the small primitive tubular structure of the prostatic cancer. These were present in two nodes, with localized extracapsular extension from one.

The final diagnosis was adenocarcinoma of the rectum with single metastases in a local rectal node and the liver, and adenocarcinoma of the prostate with metastases in aortic lymph nodes.

CASE 2

A married woman aged 70 was admitted to hospital on March 13, 1948, with a three-years history of a small lump in the right breast, about the size of a sixpence. Nine months before admission the lump became larger and she began to have dyspeptic symptoms. After ten weeks deep *x*-ray treatment was begun. She had also noticed flatus, abdominal distension, anorexia, and slight loss of weight.

Physical examination revealed a fungating growth in the right breast (upper outer quadrant) with retraction of the nipple and a palpable hard node in the right axilla, medial wall. On rectal examination an ulcer with hard everted edges was found on the posterior wall at the ano-rectal junction. There was no deep fixation. The liver and supraclavicular nodes were not palpable. On March 15 local mastectomy and proctoscopic biopsy of rectal ulcer were carried out. On April 2 the patient was discharged for post-operative deep *x*-ray therapy.

Histology.—Rectal biopsy:—A well-differentiated tall columnar-cell tubulo-papillary adenocarcinoma with origin from rectal mucosa. Infiltration into the submucosa was seen. *Breast tumour:*—Sections showed an intraduct carcinoma of the main nipple ducts, and also infiltration of the breast and cutis by anaplastic growth, composed of small compact groups of polyhedral cells, in which there were only occasional attempts at primitive tubule formation.

The final diagnosis was adenocarcinoma of the rectum and anaplastic polyhedral-cell carcinoma of the right breast.

I wish to thank Dr. G. Cunningham, of St. Bartholomew's Hospital Morbid Anatomy Department, for his help; also Mr. J. P. Hosford and Mr. Ellison Nash for permission to extract and publish clinical notes; and Dr. J. M. Sherriff for assistance in obtaining reference material. I am also deeply indebted to Dr. J. W. Whittick, of the Royal Cancer Hospital, for his painstaking advice and criticism.

T. B. WILLIAMSON, M.B., B.S.

Case of Polyneuritis after Mumps

Neurological complications of mumps are rare enough in this country to make it worth while reporting the following case.

CASE REPORT

A girl aged 4 had a typical attack of mumps just before Christmas, 1947. After two to three weeks she started to get up but complained of pains down the backs of her legs on standing, made worse by walking, and of pains in her hands when they were washed. She was miserable. On January 20, 1948, she was seen in the out-patient department and rheumatism was suspected. After rest in bed and salicylates for a week her symptoms were worse, so she was admitted on January 27.

On examination the child looked tired and pale, walking was difficult, and she could hardly stand up. There was an ill-defined dithery tremor of her upper limbs; power was equal. Her bicep-jerks were present and equal but the triceps- and supinator-jerks were absent. The abdominal reflexes were absent. The lower limbs were of equal power, but after being put to bed she could not stand up again. All tendon-jerks were absent in the lower limbs, except the right knee-jerk. Plantar responses were flexor. She objected to spine flexion beyond a sitting position. Kernig's sign and neck rigidity were equivocal. She was too unreliable for sensory testing. Her tonsils were large and red and the tonsillar glands enlarged. Her temperature was 99.6° F. (37.55° C.) and the sedimentation rate was within normal limits. A throat swab grew *Str. viridans* and diphtheroids. The haemoglobin was 100%, and the white cells numbered 10,300 (53% lymphocytes, 43% polymorphs, 4% monocytes). The cerebrospinal fluid was not under pressure but contained 70 mg. of protein per 100 ml. and 7 cells per c.mm., of which 80% were monocytes and 20% polymorphs: the sugar and chloride levels were within normal limits. A tentative diagnosis of mumps polyneuritis was made.

On February 6 a high titre of mumps serum antibody confirmed the history of mumps. By February 9 she had not improved and her cerebrospinal fluid contained 60 mg. of protein per 100 ml. and 6 cells per c.mm. No evidence of denervation was found on testing her muscle reactions to faradism.

After the middle of February she improved with massage and exercises. All tendon-jerks were absent in her lower limbs on discharge on March 9, although she was walking normally. One month later she was very well and both knee-jerks and the left ankle-jerk were present. After another month all tendon-jerks were present.

COMMENT

Cases of post-mumps polyneuritis are rarer in the literature than encephalitis or meningitis. This case seems to have been one of post-mumps polyneuritis; the diagnosis of poliomyelitis was also considered, as the signs and the finding of polymorphs in the cerebrospinal fluid were suggestive. However, in view of the recent attack of mumps the other diagnosis seemed more likely.

My thanks are due to Professor A. A. Moncrieff for permission to publish this case.

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Parotid Cysts

The following two cases are reported as rare and interesting examples of cysts of the parotid, which are themselves rare.

CASE 1

A woman aged 36 had had a swelling behind the angle of the right jaw for three months. She thought that it was the same size as when first felt; it was not painful, and did not vary in size with meals or inconvenience her in any way. There was no discharge into the mouth nor other symptoms.

On examination an oval lump about 3 by 2 in. (7.5 by 5 cm.) was felt behind the angle of the right jaw, extending up to the ear and apparently including the lower pole of the parotid gland. It was immobile, painless, not translucent, and was thought to be fluctuant, although it was difficult to be sure. It seemed too high for a branchial cyst and too soft for a mixed parotid tumour. There were no other abnormal findings.

At operation a thin-walled multilocular cyst containing clear watery fluid was found entirely covered by the lower pole of the parotid gland. The cyst shelled out with the greatest ease and had no apparent connexion with the parotid.

Pathological Report.—A very thin-walled translucent multilocular cyst 4 by 3 by 2 cm., containing clear, almost colourless watery fluid. Its wall consists of a thin collagenous layer lined by a single layer of flattened or cuboidal epithelium. Lying outside the wall are fragments of salivary-gland tissue. The appearances are those of a simple parotid cyst.

CASE 2

A woman aged 43 complained of a lump near the angle of each jaw and in the left cheek. Five years previously she had had three attacks of "mump-like" swellings and pain in one year, first of the left and then of the right side of her face; but the pain was associated with meals, and at times foul-tasting fluid discharged into her mouth. At first the swellings fluctuated with the discharge, but latterly they had remained the same size.

On examination a firm but not hard lump about 1 in. (2.5 cm.) in diameter was felt in each parotid gland just behind the angle of the jaw, and both parotids felt a little lumpy. There was also a cystic swelling in the cheek in front of the left masseter, in the line of the parotid duct, which by pressure could be partially emptied through Stenson's duct into the mouth. Sialograms showed multiple dilatations of the ducts of both parotids. There were no calculi or obstructions in the ducts. The cyst in the left cheek was excised from within the mouth.

Pathological Report.—A portion of parotid duct 2 cm. in length, with a collapsed cyst about 0.5 cm. in diameter lying alongside it. The cyst is thin-walled with a smooth lining. It has the appearance of a retention cyst, and according to its anatomical site could be either related to a branch of the parotid duct or to a small mucous gland. It is lined in part by pseudo-stratified columnar epithelium, with some of the cells showing mucus secretion, and in part by chronic granulation tissue. The surrounding stroma shows dense round-cell infiltration and an increase in fibrosis, and in one place there is a group of foreign-body-type giant cells. Along the edge of the specimen are fragments of parotid glandular tissue which also shows very considerable lymphocytic infiltration.

COMMENT

Cysts of the parotid seem to be of five types.

1. Those (usually called adenolymphomas, of which there are numerous accounts in the literature) which are considered to be either ectopic salivary tissue within a lymph gland or pharyngeal lymphatic tissue (Carmichael, Davie, and Stewart, 1935; Plaut, 1942; Willis, 1948) or of branchial origin (Cunningham, 1929; Moore, 1940), although Kraissl and Stout (1933) considered that they rise from the embryonic orbital salivary glands. They usually occur superficially in front of the ear, but may be in the parotid substance or well away from the gland, and may be almost entirely cystic, being filled with turbid brown or mucoid fluid, or part solid. Microscopically they are lined with stratified columnar epithelium which has, typically, high palisade cells in the inner layer. They tend to have papillary projections into the cyst, which may fill it, and contain much lymphoid tissue in the papillae and in the walls.

2. Cysts which occur as the result of degeneration within an adenoma (Hertzler, 1937) or mixed tumour of the parotid.

3. Hydatid cysts occurring within the parotid, cases of which have been published from time to time (Riche and Devèze, 1906; and others).

4. Cysts arising from the parotid duct (Case 2). Of these, the only account I have found is by Kini (1940), who describes a similar cyst (without any parotid swellings) lined with stratified epithelium, connected with the main parotid duct, and lying in the anterior prolongation of the gland. It is of interest to note that Johnson (1896) describes cases of swellings of the parotid gland apparently due to mucofibrinous plugs in the parotid duct, which seem to be similar in nature to the swellings in the glands of Case 2.

5. Simple parotid cysts (Case 1). There seems to be only one previously reported case (Mintzman, 1933), and that was of a cyst within the parotid substance, filled with clear fluid and lined with a single layer of flattened epithelial cells. There was no lymphoid tissue in the wall, but outside the wall were fragments of salivary tissue.

I wish to thank Mr. A. D. Abernethy for permission to treat these cases and to publish this report; I am also indebted to Dr. R. H. Cowdell for the pathological reports.

H. D. MOORE, F.R.C.S.

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Reviews

PSYCHIATRY FOR PHYSICIANS

Psychological Aspects of Clinical Medicine. By Stephen Barton Hall, M.D., D.P.M. (Pp. 416. £1 1s.) London: H. K. Lewis and Co. 1949.

Psychosomatic Medicine. By Edward Weiss, M.D., and O. Spurgeon English, M.D. (Pp. 803. £2 7s. 6d.) Philadelphia and London: W. B. Saunders Company. 1949.

What does the general practitioner and the newly qualified student really need to know about psychological medicine? This important problem is raised by the appearance of Dr. Barton Hall's book. It is a question that must be frequently discussed in the academic boards of medical schools, but it is very far from settled. There are plenty of people with axes to grind who are likely to take part in such discussions.

There are, perhaps, some guiding principles which could be considered. One of these is the relative frequency of the conditions the doctor will meet in the course of practice, a second the gravity of the decisions which will be imposed on him, and a third the relative preponderance of established fact and theoretical speculation.

It will hardly be contested that a very large part of the practice both of general practitioners and specialists in non-psychiatric subjects is made up by patients with some emotional disturbance and without detectable physical abnormality or gross insanity. On this criterion alone, much space should be allotted to the psychoneuroses in any well-balanced textbook of psychological medicine intended for the generality of medical men. If the other criteria are taken into account, however, this is less certainly so. In this section of medicine grave decisions are seldom called for, and what is known for sure stands in startling disproportion to what is so often earnestly taught. It would seem wise for the teacher to provide an account of what we know about the physiology of the emotions and show how this provides a frame of reference for the understanding of neurotic reactions, which would then be described from the clinical standpoint. The main outlines of more highfalutin theory could then be briefly laid out, so that the student could at least appreciate what it was all about when he reads some of the contributions which are made to the medical press.

In other fields of psychiatry the criteria suggested would have a different incidence. Schizophrenia is less common than the neuroses, but it is common enough, and it will often call for decisions of great importance. It is very desirable that the practitioner should be able to recognize it or suspect its presence in the earliest stages, and should then know what to do. The same thing applies to such diseases as general paresis and the dementias, but above all to depressive states in which the acute perception of the family doctor may be the only thing which stands between the patient and a tragic and unnecessary suicide.

In days happily past, but still within recall, the medical student was instructed about psychiatry by sterile lectures and demonstrations on the pathetic and irretrievable inmates of chronic mental hospitals. As Dr. Barton Hall sensibly recognizes, he needs to be provided with guidance about the conditions which he will meet in abundance in the course of ordinary practice. Perhaps Dr. Barton Hall has gone too far, however, and does not tell his readers enough about the more serious conditions they will meet, in distinction to those which are commonest.

One of the most obvious gaps in the physician's bookshelf is that which should be occupied by a short, simple, and sensible work on psychosomatic medicine. A number of efforts have been made to fill this gap, none of them very successful because they were usually too ambitious, and Drs. Weiss and English are the latest authors to try to meet this need. Psychiatrists are accustomed to speak with authority on a subject of which we really know very little. For example, it is often said that there are important psychosomatic aspects to diseases of the heart and blood vessels. By this it is usually meant that emotional factors play a part in their causation. The enhanced liability of the medical man to diseases of this kind is often attributed to a life spent in an atmosphere of rush and anxiety. Anxiety tends to raise the blood pressure and to strain the cardiovascular system. The connexion therefore seems probable enough: it has, however, not been established. The blood pressures of patients who suffer from essential hypertension show (as a rule) little response to the emotional situation of the moment, and the true anxiety neurotic, whose blood pressure fluctuates a good deal, does not seem to be specially liable to vascular disease. An analysis of the past lives, the personalities, and the present circumstances of patients suffering from vascular disease will indeed disclose sources of anxiety, but such sources would be found in any parallel group of patients suffering from other disorders.

We are not even helped in the field of therapy, since it is seldom possible to remove the causes of strain. When the experts suggest that unconscious conflicts and repressed aggression are important causative influences for which some form of deep psychotherapy is required, one may legitimately ask them to prove their case. Treatment along such lines would seem to be no better founded than other methods which the authors of *Psychosomatic Medicine* properly question, such as dietary restrictions, sympathectomy, and extensive operations on teeth and tonsils. Finally, the psychosomatic aspects of cardiovascular disease are not exhausted by a discussion of their possible emotional causation. The chain of cause and effect must be looked at from the other end, too, and inquiry made into the mental effects of the vascular abnormality. One of the most important deficiencies of *Psychosomatic Medicine* is that it gives little attention to "somatopsychic" relations.

The authors' main thesis is, however, one that deserves support. The past life, personality, and present circumstances of the patient are important: whatever the condition, the doctor should know how his patient's life is being affected by it. If this is to some extent true in a case of hernia, it is still more so in those disorders which are discussed at length in this book. Valuable lessons can be drawn from the case histories so lavishly provided. These are the most informative part of a work which could otherwise be criticized for excessive diffuseness, for a psychodynamic bias too exclusively psycho-analytic, and for the inclusion of many chapters on psychopathology of limited relevance.

ELIOT SLATER.

TEXTBOOK OF OPHTHALMOLOGY

The Eye and its Diseases. Second edition. Edited by Conrad Berens, M.D., F.A.C.S. (Pp. 1,092; 436 illustrations, 8 in colour. £4.) Philadelphia and London: W. B. Saunders Company. 1949.

This textbook of ophthalmology, written by a large number of surgeons from North and South America and Europe, including quite a few from England, was first published under the editorship of Conrad Berens, of New York, in 1936. The second edition has now appeared, and, compared

with its predecessor, it is considerably enlarged and extended. The book is now so well known in the ophthalmological world that details of its lay-out are unnecessary; it may be said that for the senior student and specialist it is one of the best available in any language. In the present edition some new authors have added contributions, and, while the previous sections have been brought up to date and occasionally rewritten, new chapters have been added on such subjects as physiological chemistry, gonioscopy, and illumination.

It is quite impressive to compare the two volumes, the publication of which is separated by 13 years, and to realize the advances which have occurred in both the medical and surgical aspects of ophthalmology. The greatest of these, of course, has been the introduction of chemotherapy, which has resulted in a complete revolution in the therapeutics of many of the infective diseases of the eye—a revolution which is fully described in the book. The production is excellent, the illustrations are numerous and very clear, and not the least useful part of the volume is the valuable bibliographies which are appended to this section. It is a good thing that the excellence of the first edition is fully maintained in its successor.

STEWART DUKE-ELDER.

SIXTY YEARS OF LONDON'S HEALTH

The L.C.C. Hospitals—A Retrospect. Published by the London County Council. (Pp. 158; 19 illustrations. 7s. 6d.) London: Staples Press. 1949.

This book is an official production with a foreword by Walter R. Owen, J.P., chairman of the London County Council for the year 1948–9. It sets out the work done by the L.C.C. during the period it was in control of hospitals. This began when the council became responsible for a mental health service in 1888 and took over the duties for the care and treatment of the mentally afflicted which hitherto had been discharged by the magistrates for Middlesex, Surrey, and Kent. In 1923 the Maudsley Hospital for the treatment of voluntary mental patients was opened, and in 1930 the five institutions for defectives and harmless sick persons of the Metropolitan Asylums Board were transferred to the council. Thus it came about that on July 5, 1948, when the National Health Service Act came into operation, 21 institutions providing accommodation for some 35,000 mental patients of various categories were handed over by the London County Council to the new authorities.

A similar story is recorded of the rise and fall of the London County Council as a hospital authority for the physically sick. By the Local Government Act of 1929 all such rate-maintained hospitals in London were transferred to the council on April 1, 1930. From this date the council became responsible for no fewer than 98 hospitals of all kinds with 71,771 beds—by far the largest number of hospitals under a single local government authority in the world.

The present volume goes on to show the efforts made by the county council to improve their hospitals and to put them on a par with the best type of hospital to be found anywhere. Some idea of this endeavour may be gleaned from the fact that, excluding capital expenditure on mental hospitals, a sum of £3¼ millions was spent on major capital expenditure and £2¾ millions on minor capital expenditure during the eleven years 1930 to 1940 inclusive. By the end of 1940 the second world war precluded further improvement, and shortly after its termination the National Health Service Act created new hospital authorities for the country.

It is interesting to note that the council state in this volume that they regarded it as a mark of confidence by the Government that hospitals were transferred to them in 1930, but express only regret when the hospitals were removed from their care in 1948. The book clearly demonstrates how earnestly the council strove to effect improvements in buildings, equipment, and personnel, and how much they accomplished in the time available. The London County Council has set an example which the new authorities will find hard to emulate.

There is only one criticism. The *Retrospect* ends with two appendices: appendix I contains the names of the administrators of the hospital services, including the members of the council, medical officers, clerks, engineers, architects, and the like. In one pregnant sentence in chapter 17 it is stated: "It is a truism that the efficiency of a hospital depends primarily upon the quality of its staff." It is to be regretted that the names of such staff are not recorded in appendix I of this memorable volume.

GEORGE F. BUCHAN.

THE MIDDLESEX

The Middlesex Hospital, 1745–1948. By Hilary St. George Saunders. (Pp. 100; 29 illustrations and 4 coloured plates. 8s. 6d.) London: Max Parrish and Co. 1949.

Much ground is covered in this booklet, for in less than 100 pages we can read the story of the Middlesex Hospital extending over 200 years.

Many old Middlesex men will be interested to revive memories of their hospital as it was, and to read of it as it is to-day. They will find here nearly all the old stories revived: the famous lady superintendent, Miss Thorold, who reigned supreme for 36 years, from 1870 to 1905. The lady probationers whom she kissed every morning; their dresses with a small train, three inches long, specially designed so that their ankles should not be revealed to the students as they bent over the beds. Cayley, the high priest of clinical instinct, who "could diagnose a case of typhoid fever better than any man in England, in fact in Europe." Bland-Sutton with his rapid and deft incision, opening the abdomen in a single cut. Pollard, assistant to the curator of the museum, who could tell you the history of each specimen, whether or not it was labelled. Sister Clark, with the tongue which did not disdain the use of the common expletive, but who had a heart of gold. Affectionately known as "Clarkie," she was the friend and confidante of generations of residents. During her last years at the hospital she worked as a pioneer in the tin shed in the front courtyard where the primitive *x*-ray apparatus was housed, and eventually succumbed to *x*-ray cancer. And mention is made of many others of greater or lesser fame.

The book is well written, well produced, and well illustrated. The most attractive of the illustrations is, I think, the coloured plate showing Northumberland Ward—but perhaps, as it is my ward, I am prejudiced. There is, however, one illustration that "never would be missed," the monochrome on page 95.

G. E. BEAUMONT.

AMINO-ACIDS AND PROTEINS

Outline of the Amino Acids and Proteins. Edited by Melville Sahyun, M.A., Ph.D. Second edition. (Pp. 286; illustrated. £1 10s.) New York: Reinhold Publishing Corporation. London: Chapman and Hall. 1948.

Twelve American chemists and biochemists from various universities and industrial research laboratories have collaborated under the editorship of Melville Sahyun in

producing this useful book. The discovery, isolation, synthesis, biological value, and metabolism of each amino-acid are described in some detail, and in the last chapter the assay of amino-acids by micro-organisms is discussed. The book therefore covers this subject fairly comprehensively, but the space allotted to proteins is disappointingly small. Theories of protein structure, and modern physical methods of protein investigation—e.g., ultracentrifuging, electrophoresis, *x*-ray analysis, and electron microscopy—are mentioned but not described. Nor is there a discussion on the problems of protein denaturation and of antibody formation in animals.

The editor recognizes these and other omissions, but states that the purpose of the book is to give a simple, accurate, and readable outline of the chemistry and biochemistry of the amino-acids and proteins, and suggests that the reader interested in theoretical and argumentative aspects should consult larger works or refer to some of the many articles cited. Many readers will nevertheless wish that more space had been given to these controversial subjects, even at the risk of including one or two speculative theories. This would have introduced some of the most important conceptions in modern biochemical research.

Subjects of special interest to the medical reader are not particularly stressed, for the book is written primarily for chemists and biochemists. The changes in plasma protein levels in disease and the analytical methods for determining them are compressed into a few pages. The work of Cohn and his colleagues on the fractionation of plasma proteins is merely mentioned in a footnote, and there are only a few pages on the use of amino-acids and protein hydrolysates in intravenous therapy. The few diagrams present are too small, particularly the electrophoresis curve on page 140.

This simple and accurate book should prove of considerable interest to chemists and biochemists, especially those commencing work with amino-acids, to whom the references should be very useful.

W. G. DANGERFIELD.

DERMATOLOGY

Dermatologie. By J. Darier, A. Civatte, and A. Tzanck. (Pp. 922; 269 illustrations. 90 Swiss francs.) Bern: Medizinischer Verlag Hans Huber. 1949.

Skin Diseases in General Practice. By F. Ray Bettley, T.D., F.R.C.P. The Practitioner Handbooks. (Pp. 260; 96 illustrations. £1 1s.) London: Eyre and Spottiswoode. 1949.

Dermatologie is a German translation of the fifth edition of the *Précis de Dermatologie* by Dr. A. Civatte (formerly by Professor Darier), which has been reviewed in these columns (January 17, 1948, p. 102). It has been translated and published in Bern with a foreword by Professor Robert and is the first edition in German to appear since 1936, when Vohwinkel's translation was published in Leipzig. It is handsomely bound and printed in larger and clearer type than the French edition and the illustrations are from the same blocks. German-reading dermatologists will enjoy the lack of verbosity of this book, which retains the individual character of the original and is faithfully translated by Dr. Eva Schwartz. They will be grateful for this new edition of one of the most widely read textbooks on diseases of the skin and for the opportunity to follow the logical and lucid exposition of the views of the French school.

Dr. Bettley is to be commended on producing a book on dermatology for the particular requirements of the practitioner. It is excellently illustrated in black and white and is concerned only with common diseases. Treatment is thoroughly reviewed and the presentation well balanced, but the author very properly emphasizes his own particular opinions. Some common affections which have been omitted should find a place in the next edition, particularly leg ulcers, chilblains, and urticaria. The eczematous reaction is most important, but to allot about 100 pages out of a total of 260 to the various aspects of this subject is perhaps out of proportion. Nevertheless, student and practitioner will appreciate this useful textbook.

JOHN INGRAM.

Introduction to Physical Biochemistry, by Professor J. M. Johlin (second edition; pp. 246; 27s. 6d.; London: Cassell, 1949), was first published in 1941. This edition has been extensively revised, but the general plan is unaltered. After a discussion of the problems that arise from investigations into the composition and function of blood—a liquid that "lends itself almost to any desired study within the fields of physical and colloidal chemistry," the author discusses in separate chapters the physical and chemical properties of water; haemoglobin; the gas laws; colligative properties of solutions; colloids; chemical equilibrium; buffer systems; indicators; oxidation-reduction potentials; respiratory functions of blood; acid-base balance; and oxidation-reduction systems. The exposition is clear, unhurried, and unencumbered by advanced mathematics; it provides a useful introductory survey for students of biochemistry. In the new edition an attempt has been made to rationalize the concept of acid-base balance in terms of anion-cation nomenclature, and the chapter on oxidation-reduction systems, that *pons asinorum* of the first-year medical student, has been effectively re-written.

BOOKS RECEIVED

Review is not precluded by notice here of books recently received

The Show of Violence. By F. Wertham, M.D. (Pp. 279. 15s.) London: Victor Gollancz. 1949.

Counting Tubes. Theory and Applications. By S. C. Curran, Ph.D., F.R.S.E., and J. D. Craggs, M.Sc., Ph.D. (Pp. 238. 35s., postage 1s. 3d. extra.) London: Butterworths Scientific Publications. 1949.

Science News 15. Edited by J. L. Crammer. (Pp. 194. 1s. 6d.) Harmondsworth: Penguin Books. 1950.

A Histology of the Body Tissues. By M. Gillison. Foreword by R. C. Garry, D.Sc., M.B. (Pp. 220. 15s.) Edinburgh: E. and S. Livingstone. 1950.

Pye's Surgical Handicraft. Edited by Hamilton Bailey, F.R.C.S. 16th ed. (Pp. 724. 25s.) Bristol: John Wright. London: Simpkin Marshall. 1950.

Psychology and Mental Health. By J. A. Hadfield, M.A., M.B., Ch.B. (Pp. 444. 18s.) London: George Allen and Unwin. 1950.

Modern Pattern for Marriage. By W. R. Stokes, Ll.B., M.D. Foreword by D. Mace, M.A., Ph.D. (Pp. 110. 8s. 6d.) London: Reinhardt and Evans. 1949.

Recent Advances in the Physiology of Vision. By H. Hartridge, M.R.C.P., F.R.S. (Pp. 401. 25s.) London: Churchill. 1950.

Biological Actions of the Adenine Nucleotides. By H. N. Green, M.D., M.Sc., and H. B. Stoner, M.D., B.Sc. Foreword by Sir E. Mellanby, G.B.E., K.C.B., F.R.S. (Pp. 221. 25s.) London: H. K. Lewis. 1950.

The Supersensitivity of Denervated Structures. By W. B. Cannon and A. Rosenblueth. (Pp. 245. 40s.) New York and London: Macmillan. 1949.

Bone and Joint Radiology. By E. Markovits, M.D. (Pp. 446. 140s.) London and New York: Macmillan. 1949.

Bring Out Your Dead. By J. H. Powell. (Pp. 304. 30s.) Philadelphia: University of Pennsylvania Press. London: Geoffrey Cumberlege. 1949.

Hemorrhagic Disorders. By P. M. Aggeler, M.D., and S. P. Lucia, M.D. (Pp. 112. 75s.) Chicago: The University of Chicago Press. 1949.

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THE GENERAL PRACTITIONER IN THE HOSPITAL

Many members of the profession, in both general and consultant practice, are disturbed at the increasing segregation of general practitioners from hospital work. Though the developments in medicine over the last decade or so are partly responsible, they ought to have had exactly the opposite effect if the greatest benefit is to be obtained from them. New diagnostic tests and decisively beneficial drugs have drawn many more sick people than formerly within the ambit of hospital practice, but in doing so they have tended to withdraw patients from time to time from the care of general practitioners into that of consultants and other hospital workers. A distinction always present has therefore been accentuated rather than reduced. Hospital staffs have had to waste time doing work well within the capacity of general practitioners, and the family doctor may come to be revered more for his certificates than for his prescriptions. Many general practitioners writing to this *Journal* have complained of their isolation from hospitals, where the latest ideas are necessarily put into practice, and also of what is in effect an increasing isolation from their patients. The result is detrimental not merely to general practice but to medicine as a whole. A committee of the B.M.A. representative of both general practitioners and consultants is at present studying the problem, and its report will be awaited with interest.

The National Health Service might have gone far to remedy this state of affairs and provided an opportunity for unifying previously separate services, yet most observers agree that it has failed to do so—indeed, that it has made matters worse. In many areas hospital boards have deprived, or are attempting to deprive, general practitioners of access to hospital beds, and they are acting in this manner with the perfectly laudable motive of improving the consultant services in their regions. But the time has come to consider whether the medical arrangements as a whole will not be gravely impaired if some sections of the health service are allowed to advance their own interests to the detriment of others. As Dr. Cole says in his article at page 661: "We are at the parting of the ways, and there is a danger that the profession will tend to be divided more and more into two sections—consultants and general practitioners—without much interchange between the two. Such rigidity and standardization should be avoided."

Last October the Minister of Health made an attempt that was generally welcomed to induce hospital boards to take a wider view of their responsibilities. In Circular R.H.B. (49) 132 he emphasized the value of general-practitioner beds in hospitals, both to patients and general practitioners.[1] He might have gone further and added that consultants are wasting their special ability and experience if they have charge of patients who could as well be in the care of general practitioners. Yet attempts are still being made to deprive general practitioners of hospital beds, and even though some decisions have been reversed general practitioners on the whole probably have fewer beds in their care than when the Health Service started. It might be helpful if all regional boards were required to include some general practitioners in their membership, and the Ministry is to be asked about the possibility of this. At present the medical representation is overwhelmingly consultant, and the boards' decisions tend to reflect rather than to transcend professional distinctions. If general practitioners are to become, as they should, partners of the consultants rather than related by the tenuous formality of a "doctor's letter," a closer association in the administrative framework is desirable.

To have full clinical charge of beds in a hospital is, as Dr. MacFeat says in his article at page 663, "the most valuable way to improve the standard and status of the general practitioner." Consultants would thereby be freed to fulfil their true role—that of giving counsel on difficult cases and taking charge of those cases outside the scope of a general practitioner. Dr. MacFeat points out that "great economy of beds in general hospitals would result," and further a short stay in a cottage hospital "can in many instances restore a patient to work in a fraction of the time taken by treatment at home." The difficulty of providing enough beds may be great at present; it may remain so for a long time; but if such beds are provided they may well reduce the time spent in hospital, particularly in the more elaborately equipped hospitals in the charge of consultants, and thereby both benefit the patient and lower the already formidable cost of the Health Service.

No one can dispute that the general practitioner should be a welcome visitor at the hospital, yet sometimes he is not. Nor is merely being welcome enough. Posts with some such name as clinical assistant have been suggested, notably in the circular referred to, and in teaching hospitals they would be a useful form of post-graduate education, as Dr. Cole suggests. Their value in non-teaching hospitals is more questionable, for,

[1] *British Medical Journal, Supplement*, 1949, 2, 168.

though they would bring the general practitioner into close association with the hospital, it is possible they would encourage the wrong kind of relationship. They are a temporary solution, and as such must be watched carefully lest they perpetuate an outmoded system and conceal a gap that is much better closed. Ideally general practitioners should be part of a team, men whom the consultants themselves should be able to consult, when occasion arises, about their patients' family history, social background, and home life. Many general practitioners would like to feel that they are expected at out-patient departments or on ward rounds when the consultant sees their cases rather than that they are accepted as visitors, welcome or unwelcome. Only thus can hospital and general practice be fully unified. Time and money may be insufficient at present to enable the profession to go the whole way, but if treatment of the disorders that impair the Health Service is delayed much longer more time and money will be needed in the end to set it right.

IODINE AND GOITRE

The first publication of the Medical Research Council's Goitre Subcommittee appeared about six years ago.[1] The evidence then put forward suggested that the incidence of goitre in Great Britain might be on the increase, especially in certain parts of the country, and it was thought that the diminution in consumption of sea fish, which are rich in iodine, was a contributory cause. The subcommittee, after quoting the benefits to the public health which had resulted from the iodization of domestic salt in the U.S.A. and Switzerland, recommended that iodine should be added to domestic salt in this country in quantities equivalent to 1 part of potassium iodide per 100,000 parts of sodium chloride. The daily requirement of iodine is estimated as 150 microgrammes (μg.) per person. In 1948 the Medical Research Council published a memorandum[2] on the subject of thyroid enlargement and the mineral content of drinking water, and in this the recommendation that iodized salt should be brought into general use was supported by more clinical and other evidence. Considering that the authority of the Medical Research Council was behind it, this recommendation has received surprisingly little attention, due no doubt to the country's preoccupation with other wartime and post-war problems. That some action is to be taken seems evident from a statement in the recently published report[3] of the Nutrition Committee of the British Medical Association: "The committee has noted with satisfaction that the recommendation contained in this memorandum regarding the prophylactic use of iodized salt is now being implemented." Whether the iodization of the vitamin tablets for expectant mothers, begun in November, 1944, should be regarded as a first instalment of a more comprehensive scheme is not yet clear. The Government Departments concerned should soon announce their proposals, for during the years that have elapsed since the M.R.C. first made known its opinion on iodization of domestic salt they have had ample time to make up their minds.

The case made for iodization of domestic salt in Great Britain by the Goitre Subcommittee is impressive. It is based on study of the incidence of goitre in Great Britain since 1800—when the first records were made; on chemical analyses of water and food; on the experience of other countries where goitre is, or was, endemic; and, finally, on special clinical surveys carried out during the war on some 6,000 children and 1,800 women in Great Britain. These surveys were organized by the late Professor J. A. Ryle and some of them were made by him personally. The Goitre Subcommittee was also able to draw upon the remarkable collection of information on goitre published by the Iodine Educational Bureau.[4] There is little room for doubt that endemic goitre in this country is an important public health problem and that iodization of all salt intended for human consumption is the only certain means of prevention. Iodization of water supplies is clearly quite impracticable. The extent of goitre can be judged from its incidence in children during the war, when it was found to be as high as 43% in Sherborne (Dorset) and 42% in Glen Urquhart (Inverness). In the village of Hook Norton in Oxfordshire 50% of the women were found to have enlarged thyroid glands. The Subcommittee estimated the total number of goitrous persons in England and Wales to be no less than half a million. A fact of great importance brought out in the M.R.C. memorandum is that the iodization of domestic salt would have no harmful effects on anybody: the amount of this "trace" element to be added is too minute to cause any side-effects. A person consuming 10 grammes of salt a day, somewhat above the average, would take in about 76 μg. of iodine—about one-third of what is in an ordinary helping of fish (4 oz.) or in two teaspoonfuls of cod-liver oil. Moreover, since November, 1944, many hundreds of thousands of pregnant women have been taking in their vitamin tablets about 100 μg. of iodine as iodide every day without any harmful effects on mother or child; and those who eat "laver bread" (a preparation of sea-weed popular as a breakfast food in South Wales) take in as much as 3,000 μg. of iodine with each ounce.

[1] Goitre Subcommittee, Medical Research Council, *Lancet*, 1944, 1, 107.
[2] Murray, M. M., Ryle, J. A., Simpson, B. W., and Wilson, D. C., *Medical Research Council Memorandum*, No. 18, 1948. London: H.M.S.O.
[3] British Medical Association, London, *Report of the Committee on Nutrition*, 1950.
[4] Iodine Educational Bureau, London, *World Goitre Survey*, 1946.
[5] Eggenberger, H., and Messerli, F. M., *Trans. Third Internat. Goiter Conf. and Amer. Ass. Study Goiter*, 1938, pp. 64–67.
[6] Kimball, O. P., *J. Amer. med. Ass.*, 1946, 130, 80.

Nothing but good has resulted from the iodization of salt in other countries where the practice has been adopted on a large scale or on a national basis—in Switzerland, Poland, U.S.A., and New Zealand. In some of these countries the amount of iodine added to salt is much higher than that suggested by the Medical Research Council—1 part of potassium iodide in 10,000 parts of sodium chloride in the U.S.A. and 1 in 20,000 in New Zealand. Experience in Switzerland suggests that the increased occurrence of goitre in recent years may be due to greater technical perfection in salt manufacture.[5] For instance, the salt supply in Canton Vaud up to 1900 was taken from a local mine and contained one part of iodine per 100,000 parts of salt, and the incidence of goitre was low. From about 1900 this local salt became more and more refined, and the incidence of goitre started to increase; it continued at a high level until iodization was begun in 1924. Kimball[6] has described a similar series of related events in West Virginia, where the unrefined salt, consumed up till 1900, contained iodine equivalent to 1 part of potassium iodide in 10,000 parts of sodium chloride. It was this fact which set the pattern for the iodization of salt in the United States. Before 1900 endemic goitre was practically absent in West Virginia, but by 1922 60% of adolescent girls were affected—i.e., 22 years after a refined table salt was introduced into West Virginia. We cannot attribute endemic goitre in this country to refinement of our native salt deposits, for these, as it happens, contain practically no iodine. The important thing, however, is that there is much endemic goitre in Great Britain, and it would not be unreasonable to try to prevent it; the M.R.C. has pointed the way.

HORMONAL TREATMENT OF ANOVULATION

In the years immediately following the menarche anovular cycles are the rule rather than the exception, and this largely accounts for the physiological state of adolescent sterility. Similarly the infertility of patients with amenorrhoea is due in most cases to an associated failure of ovulation. But the incidence of repeatedly anovular cycles as a cause of infertility in normal mature women of regular menstrual habit is not known for certain. Sharman[1] found evidence of failure to ovulate, during the cycle investigated, in 6.4% of sterile women, but others have put the figure as high as 15%.[2] Although the diagnosis of this condition has been facilitated by the use of basal-body-temperature charts the treatment remains unsatisfactory. Low dosage irradiation of the ovaries is employed in some clinics in the U.S.A. and on the Continent—with a reported overall rate of success of about 40%[3]—but it has never become popular in this country, where hormone therapy has generally been preferred. That the results of the latter form of treatment have been disappointing is explained at least partly by the fact that the precise cause and mechanism of ovulation are not known. It was originally believed that the anterior pituitary gland produced two gonadotrophic hormones, one follicle-stimulating (F.S.H.) and the other luteinizing (L.H.), and it was thought that the latter prompted ovulation. As L.H. itself was not obtainable chorionic gonadotrophin extracted from human pregnancy urine was employed in its place. But the results were poor, for reasons which were manifest when Brown and Bradbury[4] showed that human chorionic gonadotrophin is not luteinizing but luteotrophic and does not initiate ovulation or corpus luteum formation. This accorded with the views of Astwood and Fevold,[5] who first postulated that there is a third gonadotrophin, which is luteotrophic, and then developed the theory that L.H., acting together with F.S.H.—probably in a definite ratio—prompted ovulation and the early development of the corpus luteum, which was then maintained by the luteotrophic factor.

Hopes were subsequently raised from time to time that the solution to the problem lay in the administration of F.S.H. alone[6 7] or in conjunction with chorionic gonadotrophin,[8] but the first promising results have not been confirmed by later workers. Chorionic gonadotrophin in combination with a "synergic" extract of anterior pituitary gland has also been used, but without justifying the rather extravagant claims originally made for this preparation. Much more useful is the administration of thyroid extract, especially when the basal metabolic rate is low or amenorrhoea accompanies the sterility. Thyroid activity is closely related to gonadal function, probably through the action of thyroxine on the anterior pituitary gland.

The most commonly used of the hormones for the treatment of anovulation are those produced by the ovaries themselves, in the hope that they will encourage ovulation by virtue of some reciprocal action by them on the pituitary gland. Thus, beginning 16 days before the expected date of the next period, large doses of stilboestrol have been given daily for four days in an effort to "shock" the pituitary into appropriate action. Rock[9] has advised the administration of oestrogen in the first half of the cycle and of oestrogen and progesterone in the second half, but this scheme rarely succeeds except in patients with secondary amenorrhoea. In a proportion of these there is a return to spontaneous normal

[1] *British Medical Journal*, 1947, **2**, 83.
[2] Mazer, C., Israel, S. L., and Kacher, L., *Surg. Gynec. Obstet.*, 1937, **65**, 30.
[3] Lane-Roberts, C., *et al.*, *Sterility and Impaired Fertility*, Appendix 8. Hamilton, London. 2nd ed. 1948.
[4] *Amer. J. Obstet. Gynec.*, 1947, **53**, 749.
[5] *Amer. J. Physiol.*, 1939, **127**, 192.
[6] Davis, M. E., and Koff, A. K., *Amer. J. Obstet. Gynec.*, 1938, **36**, 183.
[7] Bushnell, L. F., *W. J. Surg. Obstet. Gynec.*, 1948, **56**, 556.
[8] Hamblen, E. C., and Davis, C. D., *Amer. J. Obstet. Gynec.*, 1945, **50**, 137.
[9] *Med. Clin. N. Amer.*, 1948, **32**, 1171.

menstrual cycles with ovulation after three or four such courses of therapy. In an article on the treatment of menstrual irregularities which appears elsewhere in this issue Dr. G. I. M. Swyer reports a similar resumption of ovulation when normal menstruation has returned after the treatment both of functional uterine bleeding and of oligomenorrhoea with the ovarian hormones in a form of "reciprocal" dosage. But he wisely remarks that such ovulation has occurred after rather than because of this method of treatment. This cautious attitude is to be commended, not only because of the small number of cases in his series but also because of the frequency with which ovulation is resumed spontaneously, especially in women under 35. This in fact happened in two of his cases. With any form of treatment it is difficult to establish a cause-and-effect relationship where ovulation is concerned, and even when such a relationship is conceded the action may not be a direct one: allowance must be made for the admitted influence of the mind and for the effect on the patient of the special attention bestowed upon her. However, the problem of inducing ovulation in women is of the greatest practical importance, and it is to be hoped therefore that Dr. Swyer's method of treatment will receive a thorough test not only in women with irregular menstruation but also in women with normal regular, but persistently anovular, cycles.

COST OF N.H.S.

The high and mounting cost of the Health Service was discussed in the House of Commons on Tuesday in a debate on the Supplementary Estimates. A special correspondent on page 664 of this issue analyses the cost of the Health Service since its inception and suggests remedies. It was estimated in 1946 that the gross cost of the Health Service would be £167 m. The original estimate for 1948–9 was £265 m. gross and the revised £368 m.; the original estimate for 1949–50 was £352 m. and the revised £450 m. The *net* cost to the taxpayer was estimated at £126 m. in 1946, but at the end of the first year of the Health Service it was £278 m. and at the end of 1949–50 £359 m. The estimated net cost to the taxpayer for 1950–1 is £393 m. As is well known, the cost of drugs and appliances and of the care of eyes and teeth has leaped ahead of all calculations. The original estimate for the pharmaceutical, dental, and ophthalmic services for 1948–9 was £30.8 m.; the revised estimate for 1949–50 was £109 m. The percentage of the total gross cost of the N.H.S. for these three items was 11.6 in the original estimates for 1948–9 and 24.2 of the revised estimate for 1949–50. Comparison of this with the cost of the general practitioner service is illuminating. The original estimate for the G.P. service for 1948–9 was £42 m., and the revised estimate for 1949–50 was £47.1 m. Expressed as a percentage of the total gross cost of the Health Service the figures are respectively 15.8 and 10.5. Readers of this *Journal* will agree with the comment in *The Times* that "it seems strange that the average doctor's net reward from the State should come to about £1,530 a year, while the dentist should receive—at least while the boom lasts—about £2,300." The cost of the hospital service has risen from the estimated £153.1 m. in 1948–9 to the revised estimate for 1949–50 of £232.6 m. Our correspondent draws attention to the great disparity between the revised estimate for 1949–50 and the original estimate for that year of £184.6 m.

It seems that the finances of the N.H.S. have got completely out of hand. Indeed, this is what might be expected to happen if the public is told that in effect it may have just what it asks for without having to make any direct payment at the time of getting it. Our correspondent asks the pertinent question, "How much longer is this to go on?" As taxpayers doctors have some interest in the answer to this question. As recipients of money from the State for the work they do they must see less and less chance of having their remuneration increased if they are to be satisfied that the recommendations of the Spens Committee are being fully met. As doctors, too, they will be alarmed at one unforeseen anomaly—the neglect of children's teeth. Many practitioners have drawn attention in our correspondence columns to the unreasonable claims made by patients for common household remedies and appliances coupled with the threat that the services of another doctor will be sought if the practitioner is not compliant. One way of meeting this abuse would be to make it impossible for a patient to change his doctor in less than three months, which was the limit imposed under National Health Insurance. The State itself encourages extravagance. For example, any patient who bought a satisfactory hearing-aid before the N.H.S. came in is not allowed a free battery service for it, but can obtain this if he will accept a State Medresco hearing-aid. It is, however, difficult to see how economies effected here and there by attention to this and that detail will really keep the cost of the N.H.S. in check. What would happen, for example, if building conditions in the coming year allowed local authorities to go ahead with setting up the health centres looked upon as one of the cardinal features in the new Service? Our correspondent suggests one way of making the public use the Health Service with a greater sense of responsibility and of reducing the cost—that is by imposing a charge throughout the Service. Our correspondent concludes "that the time has come to discuss not whether a charge should be imposed, but the best way of imposing it."

VITAMIN DEFICIENCIES IN METALLIC POISONING

Observations on patients and experiments on animals have indicated that "secondary" or "conditioned" deficiencies of vitamins may arise in several ways. Generally speaking there is a danger of secondary vitamin deficiency with any disease which causes impaired absorption from the alimentary tract. Thus patients with steatorrhoea or sprue usually have difficulty in absorbing fat-soluble vitamins. Infections tend to increase the rates of utilization of vitamins, and disorders in vitamin metabolism often result from injuries to the liver. It is also well known that secondary deficiencies may be produced by the inclusion in the diet of substances which antagonize the action of vitamins. Thus the phytic acid of oatmeal and other cereals opposes the action of vitamin D, raw egg yolk opposes biotin, and in livestock such diverse foodstuffs as bracken and raw fish oppose the action of vitamin B_1. Many artificial anti-vitamins have also been synthesized, usually with chemical structures analogous to those of the corresponding vitamins. Another type of artificial anti-vitamin was recognized by Peters and his colleagues[1] in their important researches on the mode of action of lewisite. This arsenical vesicant was found to interfere with carbohydrate metabolism by attacking the sulphur groupings of the protein to which vitamin B_1 is linked as part of an enzyme system. Its toxicity could be counteracted by dimercaprol, or BAL, which absorbed the arsenic and so prevented it from attacking the vitamin B_1-protein complex.

In an article in this issue Dr. William Hughes has attempted to extend the anti-vitamin theory, and treatment with dimercaprol, to other poisonous metals. One of his patients, during treatment with gold for rheumatoid arthritis, developed signs of vitamin K deficiency, as evidenced by prolonged clotting time of the blood, epistaxis, and rectal haemorrhage. These toxic effects were corrected by discontinuing the gold treatment, and by giving injections of dimercaprol and a blood transfusion. In another patient skin lesions suggestive of riboflavin deficiency were also attributed to treatment with gold which had been given eleven years previously. The lesions responded only partially to prolonged treatment with riboflavin or liver extract, combined with penicillin and sulphonamides, but healed up when the riboflavin was supplemented with dimercaprol, which considerably increased the excretion of gold in the urine. Dr. Hughes also studied the effects of mercury poisoning in an old man with heart failure, who developed a severe rash, suggestive of pink disease, during treatment with mersalyl. After discontinuance of the mercury and injections of dimercaprol the rash partially healed, but the patient succumbed to pneumonia. Thallium intoxication, which was observed in children undergoing treatment for ringworm, caused the typical lethargy and baldness of kwashiorkor, as seen in malnourished African patients. Dr. Hughes also confirmed Peters's finding that skin lesions occurring in a patient undergoing treatment with arsphenamine and bismuth for venereal disease were rapidly cured by injections of dimercaprol. Although a general theory that all toxic metals act as anti-vitamins might perhaps be premature, these interesting observations indicate a field for further research.

[1] *J. clin. Invest.*, 1946, **25**, 497.

AGENIZED FLOUR

In 1946 Sir Edward Mellanby[1] demonstrated that dogs fed on a diet rich in agenized flour—wheat flour treated with nitrogen trichloride to improve it—became subject to epileptiform fits; dogs fed on flour which had not been so treated were unaffected. Drs. P. N. Campbell and T. S. Work and Sir Edward Mellanby[2] have now isolated a crystalline toxic factor from agenized flour. Their work was guided by the use of ferrets, in which the typical epileptiform fits are produced also.

The observation of these workers that the toxicity was confined to the gluten fraction of the flour suggested that the factor might be a modified amino-acid or peptide. A specimen of the crystalline toxic factor was hydrolysed with hydrochloric acid and yielded degradation products, identified by paper chromatography as (1) homocysteic acid, (2) α-aminobutyric acid, (3) methionine sulphoxide, (4) methionine sulphone, and (5) homoserine. Since all these compounds are possible degradation products of a molecule containing the methionine skeleton, they concluded that the toxic factor was probably derived from methionine.

The crystalline toxic factor, which has also been obtained by Dr. Reiner by treating zein with nitrogen trichloride, produced severe epileptiform fits in a ferret that was given for five days an amount corresponding to 0.1 mg. nitrogen per day. This is a total dose of 3 mg. of the crystalline material: the pure toxic factor is thus 33,000 times as toxic as the flour itself. The authors lay emphasis on the cumulative effect of the toxic factor. In the ferret death can be produced by giving small doses over a period of 5–10 days, the daily intake being a fraction of that required to produce an immediate effect.

ARSENIC IN FOOD

The Minister of Food has approved for publication a report of the Food Standards Committee's Metallic Contamination Subcommittee recommending new statutory limits for arsenic in food. The limits advocated in 1903 by the Royal Commission on Arsenic were 1/100 grain of arsenious oxide per gallon (0.14 mg. per litre) for liquids, and 1/100 grain per pound (1.4 mg. per kilogram) for solids or semi-solids. The subcommittee now recommends that the quantities should be expressed as arsenic in parts per million. The limits should be 0.1 part per million in beverages ready to drink, and 1 part per million in foods not otherwise specified. Materials used in foods, if they contain more than 10% of colouring matter, are allowed up to 5 parts of arsenic per million, and beverage bases are permitted up to 1 part per million if they contain over 70% total solids. Spices may contain 5 parts per million, gelatin 2 per million, and hops 2 per million, as these are added to foods in relatively small quantities. No limit is suggested for fresh or processed sea fish,

[1] *British Medical Journal*, 1946, **2**, 885.
[2] *Nature, Lond.*, 1950, **165**, 345.

crustaceae, and shell fish if it can be shown that arsenic is natural to the fish. As for arsenical contamination, the subcommittee suggests that the Ministry should periodically receive figures of such contamination from the port medical authorities and other bodies. Three months from February 28, 1950, is allowed for representations from interested parties, before steps are taken to give these limits statutory effect.

The subcommittee is also considering the contamination of fruit and vegetables, where elements may be acquired from the soil or added accidentally. These include trace elements, which may be useful unless present in excess, and materials which may persist longer than expected after spraying. This applies particularly to such sprays as lead arsenate and the newly introduced phosphate materials, such as diethyl-paranitro-phenyl-thiophosphate, which is highly poisonous and relatively non-volatile.

PEPTIC ULCER AND ENVIRONMENT

The changing incidence of peptic ulcer, its prevalence in certain social classes, and the varying proportions in which it is found in different countries, in men and women, and in the stomach and duodenum, all provide convincing evidence of the importance of environment in the aetiology of this condition.[1] But, though many hypotheses have been put forward to account for these differences, little practical research has been attempted, and the results of the social survey of peptic ulcer undertaken for the Oxford Institute of Social Medicine were well worth recording. Setting out to inquire into the influence of habits, social circumstance, food, and occupation in the genesis of peptic ulcer, Evans[2] interviewed a group of factory workers who had proved peptic ulcers and compared the information obtained from them with the answers given by a group of non-dyspeptic workers from the same factories. The most notable difference between the groups proved to be in the habit of going without breakfast, which was customary in two-thirds of the patients with ulcers and long preceded the onset of symptoms in the majority. Other differences were found in the use of tobacco and alcohol, the employment of leisure, and in the posture assumed at work—a high proportion of the ulcer subjects being sedentary workers.

Unfortunately these results cannot be accepted without qualification, since there must be considerable doubt whether the groups were truly comparable. For, while the workers with ulcers were interviewed personally, information about the "controls" was obtained from a postal questionary. A lesser objection lies in the fact that the ulcer subjects were self-selected, having responded to an appeal for all workers who had had stomach trouble in the last ten years to take part in the investigation. According to Doll and Buckatzsch's experience[3] of factory populations the number volunteering can have been little more than a fifth of all those with peptic ulcers among the employees. Finally, even if the comparisons are assumed to be valid, difficulty of interpretation arises. For example, Evans found that a disproportionate number of the ulcer subjects smoked cigarettes, few were non-smokers, and relatively very few smoked a pipe. It may be that this means that cigarette-smoking predisposes to peptic ulcer, but, as he recognized, it may also be that "the ulcer temperament" is associated with the desire to smoke. The rarity of pipe-smoking among those with ulcers could well be due to a high incidence of dental extractions. If this investigation has not solved any of the major problems of the aetiology of peptic ulcer it has pioneered in a difficult field which scientific method is only now beginning to enter, and the experience gained should be useful to others carrying out socio-medical surveys.

[1] Doll, R., and Avery Jones, F., *Practitioner*, 1949, **162**, 44.
[2] *Publ. Hlth*, 1949, **52**, 203.
[3] *Brit. J. industr. Hyg.*, 1949, **6**, 100.

EPISTAXIS AND VITAMINS

Nose bleeding may have many causes, but usually it is due to a local vascular condition. In at least 90% of the cases the bleeding comes from the anterior portion of the cartilaginous septum at a spot known as Kiesselbach's area, though it was first described by the American surgeon James L. Little. Always unpleasant for the sufferer and occasionally dangerous or severe in its effects on the general health, its treatment has hitherto followed well-accepted lines directed at the local or general cause. Some workers have on general grounds casually suggested the administration of ascorbic acid, though none have investigated the ascorbic-acid blood levels in a series of cases. Neivert and his colleagues[1] estimated the ascorbic acid and prothrombin in the plasma of 104 consecutive patients presenting themselves with epistaxis at the Presbyterian Hospital, New York. The ascorbic acid was estimated by the method of Mindlin and Butler,[2] and values of 0.5 mg. per 100 ml. or below were chosen arbitrarily as reflecting a state of deficiency. The prothrombin assays were made by the method of Fullerton,[3] and a prothrombin time of 25 seconds or more was taken to indicate a prothrombinopenic state. In 90% of the patients either the ascorbic-acid level or the prothrombin time was abnormal, and in one-third a low ascorbic-acid level and prothrombinopenia were both present. No apparent aetiological factor for the haemorrhage was found on clinical examination in 45% of the patients, but the incidence of abnormal ascorbic-acid levels and prothrombin times in this group was about the same as in the cases when a local or general cause had been discovered. A number of patients deficient in ascorbic acid and/or prothrombin were given 15 mg. of vitamin K and 300 mg. of ascorbic acid daily for one week. Of the 36 patients in whom the clinical response could be determined, 27 were definitely improved. This work is corroborated by the findings of Macbeth and his colleagues.[4] In a series of patients admitted to a military hospital for operative treatment to the tonsils, sinuses, or nasal septum the average amount of ascorbic acid in the plasma was 0.09 mg. per 100 ml. on the day of admission, and the operative and post-operative haemorrhage was significantly lower in those cases where 1,000 mg. of vitamin C had been given daily for four days before the operation.

[1] *Arch. Otolaryng., Chicago*, 1948, **47**, 37.
[2] *J. biol. Chem.*, 1938, **122**, 673.
[3] *Lancet*, 1940, **2**, 195.
[4] *Proc. R. Soc. Med.*, 1943, **36**, 625.

REFRESHER COURSE FOR GENERAL PRACTITIONERS

POST-PARTUM HAEMORRHAGE

BY

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Definition

Every clinician knows what post-partum haemorrhage is, but it has nevertheless eluded all attempts at a satisfactory definition. Strictly speaking, post-partum haemorrhage can take place only after the birth of the placenta, but the term has been used to connote haemorrhage which occurs from the birth canal after the delivery of the child. Some describe post-partum haemorrhage as excessive bleeding, others describe it as blood loss above a certain proportion of body weight, while others define it as that degree of haemorrhage which causes constitutional symptoms. All these definitions are unsatisfactory. Under the ordinary conditions of domiciliary midwifery it is impossible to measure the blood loss and to express it in terms of body weight. Constitutional symptoms may not become manifest until some time after the haemorrhage has occurred, therefore they are no guide to either diagnosis or treatment.

I have always maintained that any bleeding, however slight, which persists after the birth of the child is post-partum haemorrhage. This definition has the merit of being precise, and, if adopted, makes it possible almost invariably to prevent excessive haemorrhage.

Haemorrhage occurring within six hours (some authorities prefer the time limit of 12 or 24 hours) of the birth of the child is designated primary post-partum haemorrhage, whereas that occurring after this arbitrary time limit is styled secondary post-partum or puerperal haemorrhage.

Predisposing Factors

These are:

(1) Anaemia.
(2) Blood dyscrasias.
(3) Insomnia at the end of pregnancy.
(4) Exhaustion during labour.
(5) Precipitate labour.
(6) Overdistension of the uterus, either by multiple pregnancy or by hydramnios.
(7) Anaesthesia, particularly when it is prolonged or too deep.

It has been asserted that red-haired women are more likely to suffer from post-partum haemorrhage than either blondes or brunettes, but I have not been able to substantiate this widely held belief. Some women give a history of serious bleeding after each delivery, and it is a wise precaution to anticipate post-partum haemorrhage in such patients even though the expected rarely happens.

It is thus clear that most of the factors which predispose to post-partum haemorrhage can be treated or prevented. In any case, it is excellent practice to give every woman a good course of iron for at least six weeks during her pregnancy. A haemoglobin estimation should be made in every expectant mother early in pregnancy. If laboratory facilities are not available the Tallqvist method, which is accurate to within 10–15%, should be adopted. The Regional Blood Transfusion Laboratories will group the blood and determine the rhesus factor, and this information is important should a blood transfusion become necessary.

Third Stage of Labour

As soon as the infant is delivered the mother should be turned on to her back and placed on a clean piece of draw-sheet. Gentle traction should be applied to the cord to remove any loop which may be present in the vagina, and, using applied artery forceps, the extravaginal cord should be put in a kidney-dish placed between the mother's thighs.

Immediately after the birth of the child the level of the fundus can be seen about two fingerbreadths below the umbilicus. At this stage it is flattened from before backwards and cannot be easily moved from one side of the abdomen to the other.

After a varying time the uterus can be seen to contract and bulge forward, and as a result of two or three such contractions the level of the fundus of the uterus rises to about two fingerbreadths above the umbilicus. It can be seen and felt to be globular and can be moved freely from one side of the abdomen to the other. Closer inspection often reveals a slight forward bulge in the abdomen immediately above the symphysis pubis. This is the placenta in the vagina, on which the globular uterus rides. It often happens that a slight spurt of blood accompanies the uterine contractions which have been described, and not infrequently the extravaginal cord can be seen to lengthen. Do not attempt to expel the placenta (unless haemorrhage occurs) until (1) the level of the fundus is well above the umbilicus; (2) the globular uterus can be freely moved from side to side; and (3) the extravaginal cord does not shorten when the uterus is drawn upwards. When these conditions are fulfilled the uterus should be gently stimulated to a contraction and the fundus pushed downwards and backwards. As soon as the placenta is delivered the fundus should be drawn upwards, so drawing the uterus from the membranes rather than dragging the membranes from the uterus. The latter should then be well massaged between the two hands, the palmar surface of the lower hand being placed just above the symphysis pubis, pointing upwards.

To Control or Not Control the Fundus?

The usual teaching in this country is that a hand should be placed, with the palmar surface pointing downwards, just above the fundus of the uterus in order to find out how it is behaving, but not to control it. So long as this hand remains still, does not keep rubbing up the uterus to a contraction, and is not itching to find out whether the third stage can be terminated, it can do no harm and may provide comfortable assurance. An increasing number of obstetricians are becoming convinced of the fact that an irritated uterus may contract irregularly and so cause post-partum haemorrhage. Some recommend "controlling" the uterus with the back of the hand, but others have

adopted the practice, very common on the Continent, of leaving the uterus alone.

I would stress that in nearly every case the uterus can be observed with the eye and therefore does not need to be handled. Secondly, so long as the placenta is in the uterus it never fills up with blood without some appearing on the draw-sheet. Therefore, while the draw-sheet remains clean and dry there is no fear that intrauterine haemorrhage is occurring. It must be stressed, however, that once the placenta is away the uterus can become distended with blood without any external evidence of bleeding.

Treatment of Post-partum Haemorrhage

It has been postulated that any continuous or intermittent bleeding, however slight, which occurs after the birth of the child is post-partum haemorrhage. If, therefore, the draw-sheet does not remain dry the bleeding must be investigated and stopped (if no clean sheet is available newspaper or brown paper well scorched in front of the fire serves almost equally well).

Some obstetricians repair their episiotomy wounds and perineal tears immediately the infant is born, while others prefer to wait until after the placenta is delivered. Much blood can be lost from such wounds, and if they are not repaired immediately any bleeding from them should be controlled with gauze or cotton-wool. If the haemorrhage is not coming from such a source the vagina should be examined in order to exclude the possibility of a vaginal laceration. Fortunately, the cervix, though it is nearly always damaged by delivery, rarely bleeds much.

The placental area is by far the most common and the most serious site from which post-partum haemorrhage occurs. We do not yet know for certain how the placenta separates, but it probably does so during the first two or three uterine contractions after the birth of the child. While the placenta remains completely attached to the uterine wall no bleeding can occur. Further, no bleeding can take place into the uterine cavity if the margin of the placenta remains attached to the uterine wall throughout its circumference. When the central portion of the placenta becomes detached a retroplacental haemorrhage occurs, and this is the probable method by which the placenta is normally separated. There is some evidence to suggest that abnormal separation of the placenta may sometimes be due to minor and unsuspected developmental errors of the uterus.

If bleeding continues, and does not obviously come from a perineal or vaginal wound, it must be assumed that it comes from the placental site. Gently rub the uterus to a contraction and see whether by this measure the bleeding can be stopped. Find out whether the placenta is partly or mainly in the vagina, and, if it is, try to express the placenta by squeezing the uterus and pressing downwards and backwards.

If the bleeding persists, and the placenta cannot be expressed, the patient should be anaesthetized and a further attempt made to express the placenta by Credé's method. If this fails, it must be removed manually and without delay.

Manual Removal of the Placenta

The patient should be placed in the cross-bed position and the external genitalia thoroughly washed with soap and water or a solution of any suitable antiseptic. "Dettol" cream should then be poured generously over the vulva, into the vagina, and over the gloved hand to be inserted into the uterus. If no sterile towels are available an ordinary boiled sponge-bag can be placed over the left hand, which is to be placed on the abdomen. The right hand follows the cord up to the placenta. If it is on the posterior wall separation is usually easier from below upwards. While controlling the uterus with the left hand, and working inside the membranes, find the layer of cleavage and separation will prove easy. After the placenta is removed reintroduce the hand into the uterus to make sure that no removable portions of placenta are left behind. It is not necessary to introduce the hand more than twice into the uterine cavity. Do not give an intrauterine douche, it is not necessary and may spread infection through the Fallopian tubes. It is essential that the uterus be felt at not more than 15-minute intervals for at least two hours after the patient is returned to bed.

Immediately the placenta is delivered give 0.25 mg. of ergometrine intravenously or 5 units of oxytocin intramuscularly. It is usually desirable to give morphine ¼ gr. (16 mg.) as soon as the patient is back in bed. It is also expedient to give penicillin prophylactically, and for those in general practice 500,000 units of procaine penicillin intramuscularly every eight hours for the first 48 hours is most convenient.

It is obvious that once the general practitioner decides to treat post-partum haemorrhage he cannot stop half-way and must proceed if necessary to manual removal of the placenta. If he thinks that the surroundings and the equipment do not justify his taking this line of action it is probably best for him to attempt to control the bleeding by giving an intramuscular injection of 0.5 mg. of ergometrine before sending for the ambulance or consultant aid.

Results of Haemorrhage

As a general rule a woman bears one serious haemorrhage better than a continuous slow bleeding over a prolonged period. For as long as 10 minutes after a severe haemorrhage the woman may appear normal, and if her ear lobes are pinched they may flush pink. The signs of shock and haemorrhage subsequently supervene. The uterus becomes atonic, and the walls may become almost imperceptible, even to a hand inside the uterine cavity.

Treatment

Morphine ¼ gr. (16 mg.) should be injected and a blood transfusion given. It is most fortunate that the blood transfusion service is available to nearly every woman in the country. Rhesus-positive blood must not be given unless the patient is known to be rhesus positive, and it is important that the doctor should always have this information to hand. While waiting for the blood it is desirable to give fluid intravenously, and sterile bottles of glucose–saline prepared for this purpose should invariably be included in the midwifery kit. In grave emergencies a teaspoonful of common salt can be added to a little water and boiled, and then introduced into a pint of sterile water and given either intravenously or subcutaneously.

When Should the Placenta be Removed?

This is sometimes a very difficult problem, particularly when the patient is shocked and has lost much blood. Provided the patient is not losing per vaginam, and the uterus is not distended, it is permissible to wait until from 500 ml. to a litre of blood has been introduced. The doctor should, however, remain scrubbed up and prepared at a moment's notice to remove the placenta. I have seen a collapsed patient have a final and fatal haemorrhage shortly after the blood transfusion had begun, and there is no doubt that the tendency is to err in waiting too long before removing the placenta. If a suitable anaesthetic is given

the removal of the placenta does not seem to harm the patient. Each case must be judged on its merits, but the sooner the placenta is removed the better.

Secondary Post-partum Haemorrhage

It not infrequently happens that haemorrhage may recur three to four hours after a primary post-partum haemorrhage has been successfully treated. It is most important that the uterus should be examined at frequent intervals for the first four hours after a primary post-partum haemorrhage. At the earliest sign of vaginal loss 0.25 mg. of ergometrine should be injected intravenously or 5 units of oxytocin intramuscularly. Fortunately the transfusion of blood makes this event less probable.

It is a matter of dispute whether it is better to remove a patient who has had a post-partum haemorrhage to hospital or leave her in her own home. The removal of a shocked patient is undesirable, but in the view of many it is better to take that risk if the patient cannot be adequately watched and treated at home.

Puerperal Haemorrhage

Haemorrhage which occurs some days after delivery (usually within 14 days) and which is not secondary to a primary post-partum haemorrhage is best termed puerperal haemorrhage. It is almost invariably due to retained products of conception and usually to a portion of placenta. The importance of examining the placenta and membranes before leaving the house, and writing down whether they are complete or incomplete, is evident. A succenturiate lobe of placenta is easily missed but is probably not the commonest cause of puerperal haemorrhage. The retained portion of placenta may be passed after a good dose of castor oil, or as the result of giving some preparation of ergot—for example:

Extractum ergotae liquidum	...	10 min. (0.6 ml.)
Acidum sulphuricum dilutum	...	10 min.
Aqua chloroformae ad	...	½ fl. oz. (14 ml.)

Sig. ½ fl. oz. t.i.d. for not more than 5 days

If the haemorrhage much exceeds the normal loss it is probably safer to explore the uterus under an anaesthetic and to remove any portion of placenta or membranes that may be present. Never give an intrauterine douche in such circumstances, as some degree of infection is sure to be present. If the haemorrhage is associated with pyrexia it is desirable to give penicillin and a sulphonamide drug—for example, procaine penicillin 500,000 units eight-hourly; "sulphatriad" 1 g. every four hours. The penicillin should be continued until the patient has been apyrexial for 48 hours, but not more than 25 mg. of sulphatriad should be given.

It is generally agreed that the placenta can be left in place for one hour with complete safety. There are some who maintain that after this time toxic symptoms may supervene. Leaving aside this interesting point, it is clearly necessary for the placenta to come away, and if it cannot be expressed within two hours after the birth of the child it is justifiable to remove it manually. As there is no urgency in the matter, circumstances might make it desirable to send the patient into hospital.

It sometimes happens that the spongy layer of the placenta becomes fibrous, and it may even be absent. In these rare cases it may be necessary to perform hysterectomy. A partial placenta accreta associated with post-partum haemorrhage is a complication which is fortunately rare, but which may prove fatal.

Unusual Causes of Post-partum Haemorrhage

It sometimes happens that small vessels in the lower uterine segment are torn. Bleeding may be controlled by plugging the uterus with six yards (5.5 metres) of four folds of 6-in. (15-cm.) gauze. This line of treatment is not without danger and is very rarely indicated. Rupture of the uterus can be an undiagnosed cause of post-partum haemorrhage.

Post-partum haemorrhage not only kills directly but it renders the woman prone to death from shock or from puerperal infection. It is universally agreed that obstetric shock rarely if ever occurs apart from haemorrhage. It has been said that there is no such thing as obstetric shock, but only shocking obstetrics. If it does not kill, it incapacitates and may lead to prolonged ill-health and infertility. There is, moreover, evidence that it may cause damage to the anterior pituitary gland and thus have severe consequences.

Summary of Treatment

During Pregnancy.—(1) Routine haemoglobin estimations, (2) a course of iron therapy, and (3) prevent insomnia.

During Labour.—(1) Never allow labour to be prolonged without adequate sedation, (2) treat hydramnios with respect and if possible in hospital, (3) never hurry the second twin, (4) avoid prolonged or deep anaesthesia, and (5) it is quite a good practice, if a second pair of hands is available, to inject 0.125 mg. of ergometrine intravenously as soon as the anterior shoulder is delivered.

The proper treatment of post-partum haemorrhage is to prevent it. Look after the steady trickle and the flood will take care of itself.

THE TEACHING HOSPITAL AND THE GENERAL PRACTITIONER*

BY

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So much has been said and written lately on this subject that it is difficult to speak on it without platitudes. I do not hope to put forward new ideas, but to express and clarify my own views on a well-known topic so that discussion and interest may be stimulated. I shall start with some comments on the increased responsibility of the general practitioner.

During the last twenty years a sequence of discoveries has given him greater powers. Where hitherto he played a relatively passive part, he has now been given remedies which tip the scales between life and death. Many diseases which could be treated only symptomatically and were often fatal can now be aborted and cured by specific remedies. Most forms of meningitis, pneumonia, and infective endocarditis are examples of infections, and there are many others in which prompt action by the general practitioner may make all the difference between death and recovery or between a short and comparatively slight illness and a long and disabling one. Twenty years ago failure or delay in diagnosing these was mainly a blow to the doctor's pride: to-day it may be lethal to the patient.

*A lecture delivered at Addenbrooke's Hospital on November 9, 1949.

Again and again it is early diagnosis by the general practitioner which is the saving factor. The fact that such patients may be subsequently admitted and treated in hospital must not blind us to the cardinal importance of the early diagnosis or the early recognition of severe illness which sent them there. I feel that this change in potential of the general practitioner's work is not given sufficient recognition. Because such cases are relatively rare and have to be recognized while work is being done at speed in a crowded surgery or in the rush of an epidemic, they are a greater challenge to the keen man. Even excluding these more dramatic episodes, to see that every patient in a practice gets the best of modern preventive and therapeutic treatments is a stimulating task not easily performed.

It follows from these considerations that it is essential for a general practitioner to keep in close touch with a teaching hospital so that he may constantly learn the use of newer and more efficient methods of diagnosis and treatment. At present there is too great a time lag between the introduction of a new remedy and its general use—for example, mersalyl and the sulphonamide drugs. Only by close contact between practitioners and teaching hospitals will this lag be reduced.

Clinical teaching may for convenience be divided into two categories: (1) undergraduate (before medical qualification), and (2) postgraduate.

Undergraduate Teaching

A great deal has been said and written on the unsuitability of the teaching given to medical students, the majority of whom are destined for general practice. This criticism is to some extent justified, but it must be remembered that every medical student should be given a wide view of medicine and surgery if he is to acquire balance. It is important for him to know a little about many things which he may never be called upon to practise in detail. He spends long hours watching major surgical operations which he will never perform, but it is only in this way that he can learn all that a major surgical operation means to the patient. To make teaching at this stage more appropriate the British Medical Association suggested in 1943 that general practitioners might be included in medical faculties or medical school committees. They would advise on the curriculum so far as it related to general practice, and they might also help in actual teaching. This sensible suggestion is surely worth a trial.

I will make only two suggestions, which I believe would improve the teaching of all medical students: (1) that all consultants during their early training should be encouraged to spend a period in general practice, say two or three months; and (2) that in teaching hospitals more emphasis should be laid on the management and treatment of patients after organic disease has been excluded. These are often the most difficult and the most interesting problems in medicine, and they tend to be referred back to the practitioner without sufficient comment.

Apart from these two measures, I do not think it would be wise to burden the already overloaded curriculum with more courses. Most special teaching for doctors in general practice is better given after qualification.

Postgraduate Teaching

In considering the problem of postgraduate teaching for general practitioners, I would first like to discuss how the teaching hospital teaches postgraduates. Most teaching hospitals, by virtue of a few brilliant men, excel in some particular line. These build up departments which attract doctors from far and wide to do research and work on special problems. Such departments make outstanding contributions to medicine and surgery, and it is on these that the reputation of a hospital is largely built.

On another plane, many teaching hospitals give facilities for doctors to attend for clinical instruction, to work for higher examinations, or to write theses.

Instruction for general practitioners has never been highly organized, and it is worth while to consider this in greater detail. Before 1939 refresher courses were held at many hospitals under the aegis of the Ministry of Health. These usually dealt with general medical and surgical topics and lasted two or three weeks. This form of spoon-feeding, though of some value, left much to be desired, particularly because it gave little opportunity for personal observation and reflection. More recently, lectures and teaching rounds for general practitioners living within reach of a teaching hospital have been staggered to week-ends or to a particular day of each week so that attendance need not involve engaging a locum, and these again are filling a gap. Medical societies and clinico-pathological conferences are also of great teaching value for practitioners who live within range.

Many hospitals also offer facilities for general practitioners to attend lectures and the clinical teaching in any department of the hospital. In a well-organized teaching hospital this is probably the ideal method, but it is open to the obvious disadvantage that many doctors find it difficult to leave their practices for periods long enough for this to be worth while.

These are some of the organized methods by which general practitioners can get postgraduate instruction. They are satisfactory so far as they go, but economic reasons make it difficult for practitioners to take full advantage of them.

Personal Contacts

I want now to consider the more individualistic aspect of teaching by a teaching hospital—personal contacts between the staff of all grades and the practitioners in the area it serves. Lipscomb (1949) has published an article called "Seeing the Patient Through," which illustrates with depressing clarity the various ways in which the contacts between consultant, registrar, house-man, practitioner, and patient break down, and with what serious results.

The most important way in which the teaching hospital influences the doctor in the area is by the quality of its work. The only justification for the lavish staffing and equipment of a teaching hospital is that its work should be impeccable. This should be the ideal before every member of the staff. If a very high standard of work can be attained and contacts be maintained with all doctors in the area, the whole medical tone will automatically rise.

Of these contacts, perhaps the letters written by practitioners to consultants, and vice versa, are the most important. The doctor can so often provide the missing link essential for diagnosis. The work done in the hospital is often largely wasted if a clear report is not sent promptly by the consultant or his representative when the patient is discharged, or after he has been seen in the out-patient department. If such letters are of high standard their educational value is enormous. It follows that the staff secretarial organization must be highly efficient, and it should be deliberately developed to play its part in teaching.

In his letter the practitioner should aim at sending information which the consultant might not find easy to elicit from the patient: facts about family and past

histories, the significance of which the patient might not realize; results of past investigations; suspected diagnosis and treatment already given; personal observations during an attack of pain or a fit; environmental considerations. Often he alone can supply these facts, and they may be essential. On the other hand, the letter from the consultant to the practitioner should contain not only the main clinical summary but the results of special investigations, the diagnosis, treatment given, and comments on future management and treatment. Other details of more academic interest should often be added. A list of negative investigations is not enough.

Most practitioners are already overburdened with secretarial work. To lessen this burden certification should be reduced to an absolute minimum, for there is no greater handicap to good medical work than the constant distraction of signing certificates. A doctor so employed may be likened to an artist trying to paint a picture who is called away to answer the door every few minutes. The hospital should also notify those practitioners who wish it of the times of operations on their patients. Full details should be written about patients who die, with necropsy results, and opportunity given to the practitioner to attend these examinations. Other contacts which should be made the most of are visits by the practitioner to his patients in hospital and consultations with the practitioner in the patient's home.

The question of how far it is workable for practitioners to refer patients for investigation direct to teaching hospital laboratories and to radiological and other special departments without sending them through the out-patient department must depend on the facilities available. In principle it is a desirable arrangement, but in practice it may mean such a spate of work that efficiency is impaired, and then the intermediate filter of the out-patient department is essential. It should be allowed with the reservation that full clinical information must be sent with the patient. A radiologist, for example, should not be expected to *x*-ray a patient without having information about the results of a full clinical examination. Special investigations should always be supplementary to this. With this reservation, I believe there would be no difficulty, and a good deal of work would be short-circuited from the out-patient department to its advantage.

There is one other contact which is of great importance, and that is between the staffs of teaching hospitals and general practitioners who are on the staff of other hospitals in various capacities in the region. In the future, as in the past, there will be many men of great ability with specialist qualifications and training who are in general practice. Their hospital work will be mainly done outside teaching hospitals, but their association with the latter should be close. In the past, general practitioners working in isolated hospitals often lacked any contact with both teaching hospitals and consultants, but with the present reorganization there is no reason why this should occur.

It is argued that there is now little scope for appointments of the clinical assistant type for those in general practice; such hospital work, at any rate in larger hospitals, is better done by registrars who are in training to be specialists. This may or may not be true, but, even it is is, it is only half the answer. It must be weighed against the stimulus and incentive such posts afford to those in general practice and against the fact that they bring the consultant and the practitioner into working contact in the hospital. Both will learn what they could not in any other way. In considering the appointment of general practitioners as clinical assistants to teaching hospitals it is important to think not what they will do but what they will learn. It should also be remembered that they find it easier to attend hospital when they have an obligation to do so. If there are more applicants than jobs a judicious rotation could be arranged.

We are at the parting of the ways, and there is a danger that the profession will tend to be divided more and more into two sections—consultants and general practitioners—without much interchange between the two. Such rigidity and standardization should be avoided. If opportunity can be given for consultants and general practitioners to work together in hospitals, it will help to avoid this partition, to the benefit of both and in the long run to the advantage of the patient.

Conclusion

To sum up, a teaching hospital should exert its basic educational influence on practitioners by the excellence of the work and efficiency of its contacts with him. It should aim at making itself the centre to which he can go for advice or knowledge, knowing that he will be welcome. Such help should be given enthusiastically as a recognized part of the teaching work of the hospital. That work will be supplemented by other organized teaching, and this will be subsidiary to its highest and most important educational function, which is research. If the latter is recognized as production, the former is distribution, and both are important if the patient is to get the best service.

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THE FAMILY DOCTOR IN THE N.H.S.

BY

GEORGE MacFEAT, O.B.E., M.B.

The N.H.S. has been in operation for nearly two years and has developed sufficiently for us to determine, in some degree, how far it will fulfil our desires and aspirations. For such an important and growing Service a strong foundation is essential, and it is acknowledged that the general practitioner must occupy that place in the structure. It follows, therefore, that every effort should be made to attract the best type of recruits to general practice; to provide undergraduate training adequate for the purpose; to make available postgraduate education to refresh and extend the practitioner's experience and interest in his work; and to secure such facilities and associations with hospital work as will afford him opportunities of exploring special fields. The attraction of suitable recruits is essential to the quality of the Service, and depends largely on attractive opportunities and rewards being offered. These are what we must strive to secure.

A great deal has been written recently on undergraduate training. If the suggestions made were implemented by the medical schools the results would be of great value, and it is up to the schools to play their part. Postgraduate medical education is essential, and there should be some measure of compulsion or reward to secure its full benefits, which are considerable in developing a satisfactory Service.

Work in association with hospitals forms the best type of postgraduate education and has many other advantages.

The contact with specialists is most valuable, as it affords opportunities for discussion about individual cases. This helps the doctor in his work and adds greatly to his interest and knowledge. This association with the hospital may be a loose one, consisting of occasional visits by the practitioner to his own patients and consultation with the staff about their progress; or he may secure an appointment as clinical assistant to a unit, general or special according to his desire. This is a valuable training, as the responsibility of the post, though it may last only two or three years, will enhance the value of the experience gained.

General Practitioner Hospitals

Undoubtedly the most valuable way to improve the standard and status of the general practitioner would be the provision of "general practitioner hospitals," or wards in general hospitals where the family doctor can care for his own cases. Consultants and specialists would have no beds in such hospitals or wards, but would be available for consultation for both in-patients and out-patients. Ancillary services—for example, physiotherapy, chiropody, etc.—would be available. Such hospitals or wards would accommodate patients whose treatment was within the scope of general practice. Those needing specialist treatment would be taken to the general hospital or the specialist's own wards. Great economy of beds in general hospitals would result, and a quicker turnover of patients secured. It is found in cottage hospitals that a short stay, with its controlled treatment and discipline, can in many instances restore a patient to work in a fraction of the time taken by treatment at home.

The provision of general practitioner hospitals, where all the doctors in the area may treat their own cases, would prove valuable in enabling the practitioner to fulfil his proper professional responsibilities. They would provide facilities for observation and special investigations, and allow continuity of treatment when removal to hospital was necessary. The contacts with fellow practitioners and the team-work it involves would encourage the best type of group practice and a higher standard of efficiency, with great benefit to the community. The advantages are no less important in the town than in the country, and general hospitals would be relieved of cases for which their special resources were not required.

General practitioner hospitals should be open to all general practitioners in the district, and dentists should share in their use. They should be controlled by a committee of local doctors and dentists. Many years will be required to implement these schemes, and it is well that progress should be gradual, and that experience should demonstrate the best way to overcome the problem in each district. In some areas such hospitals are urgently required and could serve as health centres—an innovation that would have an enthusiastic welcome. They might save on nursing personnel, as the patients might not require so large a staff owing to a smaller proportion being seriously ill. Undergraduate and postgraduate teachers might find useful cases in these wards; and facilities would be provided for early diagnosis, without which efficient specialist treatment is not possible.

Group Practice

The development of group practice is to be desired. In such groups there is a tendency for members to specialize in medicine, surgery, gynaecology, otolaryngology, etc., by work in hospitals as clinical assistants or associates in special units. Regional hospital boards and boards of management could help in providing these facilities; such an arrangement would relieve some of their staffing problems. This may prove a valuable mode of entry into specialization and provide a way back, though it is hoped that general practice may itself be able to claim a status comparable to that of any other department of medicine. It will be easier for a group to make a diagnosis if some members have contact with hospital departments and are able to secure the assistance of specialist and trained staff.

It has been suggested that the title of associate physician should be attainable after service in the medical unit of a general hospital for a number of years. Similar considerations apply in varying degrees to obstetrics, gynaecology, paediatrics, and other specialties, according to circumstances and areas. This may provide a way to consultant rank.

Experience of general practice renders consultants more valuable to practitioners. There are some doctors who, while preferring to remain in general practice, have through their experience and ability earned such a reputation with their colleagues that they would be available for consultation. Suitable rewards should be provided for such services, which would be valuable in many areas and relieve the general hospitals of many minor cases.

BILL OF HEALTH

FROM A SPECIAL CORRESPONDENT

This is Estimates Month. The Supplementary Estimates of Expenditure for the current financial year 1949–50, which were held up because of the General Election, were published the day after the new Parliament was opened by the King. At the same time there appeared the "vote on account," which shows the estimated civil expenditure of the Government Departments, analysed under main heads, in the coming year, 1950–1.

Until the details of the Civil Estimates are issued, later in the month, it will not be possible to obtain a complete picture of the cost of the Health Service next year and compare it with the cost in the year just ending. Already, however, one thing is clear. As the following table shows, only a small rise is expected in the total to be spent on the social services in 1950–1. But another considerable addition will be made to the total cost of the Health Service.

	Revised Estimate 1949–50	Original Estimate 1950–1
	£m.	£m.
Min. of Education and Public Education (Scotland)	212.0	219.5
University grants	17.7	23.4
Min. of Nat. Insurance (inc. family allowances)	209.9	214.6
Assistance Board	87.3	83.9
Housing	66.4	60.8
Min. of Food (inc. food production services of Min. of Agric.)	477.6	444.4
National Health Service	**358.5**	**392.9**
Total	1,429.4	1,439.5

To some of the items given in the table will have to be added amounts spent by local authorities and met by the ratepayer. In any comparison of the relative costs of, say, education and the Health Service it has to be remembered that rate-financed expenditure accounts for only a small proportion of the total cost of the Health Service, by far the greater part falling on the national budget and the taxpayer, whereas the local education authorities were expected to spend some £90 million from the rates in the current financial year. Nevertheless, with the exception of the food subsidies, the Health Service dominates the total social service budget.

Even more significant than the cost of the Health Service in relation to that of the other social services is the progressive rise in its cost since it was introduced. In the financial memoranda to the two National Health Service Bills (one

covering England and Wales and the other Scotland) it was estimated that the gross cost to the taxpayer in a year would be £167 million. The following table shows how completely this estimate has been falsified.

	Gross Cost	Offsets and Appropriations in Aid†	Net Cost to Taxpayer
	£m.	£m.	£m.
1946	167	41	126
Original estimate 1948–9*	265	65	200
Revised estimate 1948–9*	368	90	278
Original estimate 1949–50	352	92	260
Revised estimate 1949–50	450	91	359
Original estimate 1950–1	484‡	91‡	393

* Calculated on annual basis. † Of which the most important are the contributions from the National Insurance Fund, superannuation contributions, and recoveries by hospital boards in respect of services. ‡ Assumed.

It will be seen that the net cost to the taxpayer in the coming year will be more than three times the admittedly tentative estimate made in 1946. What is the explanation? Government spokesmen have so far given three reasons for the steady rise in expenditure. First, they say, there has been a rise in prices and costs since the National Health Service Bills were before Parliament. That, of course, is true, but the officially calculated rise is no more than 18%. The second reason, which is to a certain extent related to the first, is the fact that the earnings of all the various practitioners in the Health Service had not been fixed when it came into force; in fact, negotiations had not even begun. The third reason has been the unexpected demands made on the Service by the public.

There can be no doubt that it is public demand that has been the chief cause of the high cost of the Health Service. In no other social service has a Ministry been so completely in the dark when making an estimate. The number of children of school age is known, and it is therefore possible to calculate the cost of their education fairly accurately. It is also possible to calculate fairly exactly the number of houses that should be built. But the demand for the facilities of the Health Service must always remain a great imponderable. Children either go to school or do not go to school; there can be no doubt about it. But standards of good health and bad health are subject to an infinite number of gradations. It may be possible to estimate fairly closely the number of cases of some of the well-recognized diseases that are likely to occur in a given period. But it is quite impossible to estimate the amount of vague and ill-defined illness in general, still less the extent to which the sufferers will avail themselves of the Health Service to obtain relief.

In this connexion the estimates for the pharmaceutical service, the dental service, and the supplementary ophthalmic service are particularly revealing, for their cost is based on the principle of payment for each item of service rendered and therefore reflects the extent of the demand.

	Original Estimate 1948–9*	Revised Estimate 1948–9*	Original Estimate 1949–50	Revised Estimate 1949–50
	£m.	£m.	£m.	£m.
Pharmaceutical service	16.9	23.6	20.8	35.3
Dental service	10.8	29.1	30.9	48.6
Ophthalmic service	3.1	20.0	14.7	25.1
Total	30.8	72.7	66.4	109.0
% of total gross cost of Health Service	*11.6*	*19.8*	*18.9*	*24.2*

* Calculated on annual basis.

There are three significant points to notice about these figures. First is the gross underestimating of the cost which has already been commented upon. Secondly, the proportion of the total gross cost of the Health Service accounted for by prescriptions, teeth, and spectacles has risen this year to as much as a quarter. Whether the proportion will fall is a matter for conjecture. A year ago the Ministry of Health was arguing that a large part of the demand for these services was non-recurring. Free aspirin was a novelty, as were free spectacles and free dentures. Many people, it was also argued, had put off buying spectacles until the Health Service had come in. The reductions in the original estimates for 1949–50, compared with the revised estimates for 1948–9 in respect of the pharmaceutical and supplementary ophthalmic services were the result of these considerations. Moreover, some months ago, in reply to the report of the Select Committee on the Estimates, which had investigated the causes of the large Supplementary Estimates in 1948–9, the Ministry of Health said that there were signs that the demand for spectacles was falling off, though not the demand for dental treatment. There is also the proposed charge of up to 1s. for prescriptions to be considered. If this is put into force, there should be a fairly big reduction in the cost of the pharmaceutical service. But, after this year's supplementaries, anything can be expected.

The third point to notice about the cost of the pharmaceutical, dental, and ophthalmic services is how large their total is, and how large each is, relative to the cost of the general practitioner service. Readers of the *British Medical Journal* have no need to be reminded that the basis of the general practitioners' remuneration is a fixed capitation fee, which means that the total cost of their services can be estimated much more closely than can services based on payment for each item. This is shown in the following figures giving the estimated cost of the general practitioner service.

	Original Estimate 1948–9*	Revised Estimate 1948–9*	Original Estimate 1949–50	Revised Estimate 1949–50
	£m.	£m.	£m.	£m.
General practitioner service	42.0	45.1	45.8	47.1
% of total gross cost of Health Service	*15.8*	*12.3*	*13.0*	*10.5*

* Calculated on annual basis.

In the current financial year, therefore, the State has paid chemists for dispensing prescriptions about three-quarters of what it has paid to the doctors who did the prescribing—and who have the responsibility of their patients day in, day out. To dentists it has actually paid more than to the general practitioners.

The expenditure on the services provided by local health authorities has also, like the cost of family doctoring, been roughly the same as the original estimate in the current financial year. Grants to local health authorities have been as follows:

	Original Estimate 1948–9*	Revised Estimate 1948–9*	Original Estimate 1949–50	Revised Estimate 1949–50
	£m.	£m.	£m.	£m.
Exchequer grants to local health authorities	5.4	13.6	15.1	15.4
% of total gross cost of Health Service	*2.0*	*3.7*	*4.3*	*3.4*

* Calculated on annual basis.

A sum approximately equal to that shown in the table is, in addition, spent by the local health authorities out of the rates. But even if this addition is made, there is still an extraordinary discrepancy between the amounts spent on the local health services—which include the care of mothers and young children; midwifery; health visiting; home nursing; vaccination and immunization; ambulance services; home helps; duties under the Lunacy and Mental Deficiency Acts; as well as all the services connected with the prevention of illness and aftercare, and the establishment and maintenance of health centres, if any—and the amounts paid to chemists, dentists, and optical practitioners. The discrepancy between the £48 million paid to the general dental service and the amount spent on the whole of the local health services reflects, among other things, the withdrawal of dentists from the service of local authorities where they give priority treatment to children and expectant and nursing mothers.

Last, but greatest of all, has to be considered the hospital service, which has also exceeded its estimate in each of the two years that the Health Service has been in operation.

	Original Estimate 1948–9*	Revised Estimate 1948–9*	Original Estimate 1949–50	Revised Estimate 1949–50
Advances to regional boards and boards of teaching hospitals:	£m. 159.9	£m. 190.9	£m. 195.0	£m. 243.3
of which capital expenditure ..	*6.8*	*10.5*	*10.4*	*10.7*
Maintenance expenditure ..	153.1	180.4	184.6	232.6
% of total gross cost of Health Service	*57.4*	*49.0*	*52.4*	*51.7*

* Calculated on annual basis.

The increase in the revised estimate for 1948–9 over the original estimate is not surprising, for the latter was prepared long before the Health Service was introduced, and information on hospital costs was notoriously scanty. What is much more significant, and alarming, is the big supplementary required in the present year over the original estimate. When the boards and management committees first drew up their budgets for 1949–50 and submitted them to the Minister of Health, they were asked to make reductions which would have amounted in all to some 10% of the total budgets. That presumably was why the Ministry's original estimate for 1949–50 showed such a comparatively small rise over the revised estimate for 1948–9. The hospital authorities, however, replied that if the reductions asked for were made they would have to close beds as well as postpone essential improvements—in other words, the cuts could be made only at the expense of the patients. In addition, during the present financial year the salaries of specialists and other medical staff working in the hospitals were finally negotiated and were made retrospective to July 5, 1948, and the salaries of ward sisters and staff nurses were increased. Hence the big supplementary estimate of £48 million.

But how much longer is this to go on? Most of the proposed increase in the total cost of the Health Service in the coming year may be presumed to be accounted for by the hospital service, and still there is no sign that the end is in sight. There can be few hospital authorities that are satisfied that they have no need for further expansion, even fewer hospitals where there is no waiting-list for in-patient and out-patient treatment. To take a concrete example—there would be a considerable additional cost to the hospital service if the 10,000 tuberculous people at present waiting for sanatorium beds could be taken in. This eminently desirable objective could be achieved if the State were to decide to double or treble the salaries of nurses in sanatoria, divert money and materials from building houses and schools to extending sanatoria, and increase their medical establishments. In other words, it could be achieved —at a cost.

The Ministry of Health, however, knows quite well that the cost has to be counted. It can be criticized for giving the tuberculosis service such a low priority in the Health Service as a whole, but not for realizing that the cost does matter. The trouble is that it appears to have lost control of the total cost of the Health Service and cannot therefore enforce any limit that it attempts to impose. Up to now, with each excess in expenditure over the budget, it has claimed that there was adequate explanation. Salaries had not been fixed; liabilities of the former voluntary hospitals had to be met; and so on. The time for excuses, however justifiable, has come to an end. In his Budget speech last April, Sir Stafford Cripps said that the Departments had been told that they must stick closely to their estimates and that only in cases involving a major change of policy would supplementary estimates be allowed. The Supplementary Estimate for the Health Service, amounting to all but £100 million, shows not only that the Ministry of Health has lost control of those responsible for running the Health Service but that the Treasury has lost control of the Ministry of Health.

The time has therefore come for some very hard thinking by all concerned, practitioners and patients no less than members of the Government. If the cost of the Health Service is to be allowed to rise indefinitely, it can be met either by reducing expenditure on the other social services and on defence or by increasing taxation. Doctors are sometimes inclined to think that the treatment of the sick should have an absolute precedence over all other expenditure. It is a very natural attitude in the light of all that they see needs to be done, but it is very one-sided. Already the Government's expenditure on the Health Service has reached half of the amount spent on defence. Obviously a health service is a much more desirable object of expenditure than is defence; but what would be the use of a health service if Britain were not strong enough to prevent, or fight, another war? As for the other social services, it is by no means certain that a health service is more desirable than education or housing. Even doctors may admit that better schools and better homes are at least as essential as better hospitals, and that if they were provided the demands made on the health services might well be reduced.

The alternative is to increase taxation. But already, to meet the cost of the social services, of defence and the other obligations of the central Government and local authorities, the State is taking, by taxes, rates, or insurance contributions, some 40% of people's incomes. Already this is considered to be having a dangerous effect on the national economy by destroying incentive and discouraging savings. It is thus working against a rise in the national income, which is the only sure way of maintaining the Welfare State. Moreover, the higher the burden of taxation the more people will tend to make demands on the Health Service as one way of getting some of their money back. It is doubtful whether taxation can be increased much further without disaster. Yet if it is not increased, if the heavy Government expenditure is not met by heavier taxation, if inflation is allowed free rein, the results will be even more serious: further rises in prices and costs—which will further detract from the value of the social service benefits, make British goods even less competitive abroad, and make the dollar gap still wider. It will be too late to consider economies in the Health Service when Marshall Aid has come to an end and Great Britain, forced to curtail purchases of food and raw materials abroad, once again has two million unemployed.

In short, economies in the Health Service must be made, and must be made now. There are three possible ways of making them. One is by reducing the fees and salaries of the various practitioners. But to make any worth-while reduction these would have to be on a large scale, which would probably result in wholesale withdrawals from the Service. Otherwise they would merely cause a lot of discontent and save very little. The second is by making a charge to the public for some parts of the Service—for spectacles, wigs, invalid chairs, and appliances. The third way of making economies, and the most equitable and effective, would be to impose a charge throughout the Health Service. This course would certainly not be popular. It would mean the revival of the needs test so that hardship would be avoided. It might mean that cases genuinely needing treatment would go neglected. But can any doctor be certain that that is not happening now, with crowded surgeries and long waiting-lists? In any case there is no real alternative. The time has come to discuss, not whether a charge should be imposed, but the best way of imposing it.

The Ministry of Health has sent a circular to hospital boards and committees giving advice on the use of Samaritan Funds and other similar funds. If a non-transferable fund was administered by the old governing body of the hospital and was held by it or by trustees on its behalf, the old governing body, so long as it exists, should continue to administer the fund. Provided that the fund in question is of such a nature that the hospital board or committee has power under Section 59 of the Act to accept, hold, and administer it, it will probably be possible for the board or committee to be regarded as the successors of the old governing body in the administration. In this case arrangements should, if possible, be made for the transfer of the fund to board or committee as the case may be. But a trust for the benefit of persons who have left hospital (unless it is to provide convalescent treatment) does not appear to be one that a board of governors or hospital management committee has power to administer. Whatever arrangements are made for the future administration of non-transferred funds the terms of the trust cannot be varied, except under authority of a scheme made by the Charity Commissioners.

Preparations and Appliances

PREVENTION OF WELDERS' FLASH

Colonel R. M. DICKSON, Director, W. H. Ross Foundation (Scotland) for the Study of Prevention of Blindness, writes: Electric-arc welding has become a major process in shipbuilding, and "welders' flash" is a common disability, responsible for considerable loss of working time. The cause and symptoms of the condition are well known to industrial workers and recapitulation is not necessary. The object of this report is to explain the value of a recent development in protection of the eyes.

In this country the routine method of protection is coloured goggles, both for the welder and for his mate, and the welder in addition wears a helmet. The best glass is yellowish-green in colour and the different densities are standardized. The glass gives adequate protection while in use, but the danger has always been the temporary removal of the goggles to see better—the welder, for example, while chipping, and the mate to select tools or see obstructions on scaffolding. There are many excuses for removing coloured goggles temporarily, and as a number of welders usually work in close proximity the flash is from a light in the immediate neighbourhood. The time of exposure to the naked light may be short, but the effect on the eyes is cumulative during a working day.

It was discovered in American shipyards that clear goggles give enough protection against ultra-violet radiation, and this seems to have solved the problem.[1] Clear goggles need never be removed for any reason whatever while welding is in progress, and flash never occurs. This was all explained at a large shipbuilding yard on the Clyde a year ago, and the workers were asked to give the clear glass a fair trial. There was much scepticism and controversy, and the question arose who would be the guinea-pig.

The trials were carried out by the ambulance-room attendant, who looked at the light for two hours as close as the welder himself. He then worked for a whole morning as a welder's mate, and, to make the test more severe, in the intervals of welding he looked closely at the next light. The eyes showed no reaction whatever.

These tests were most convincing to all concerned, and now the welders and their mates wear clear goggles. When the welder removes his helmet for chipping, the clear glass protects the eyes against flying fragments in addition to protecting against flash. There is no temptation to remove the goggles as there is no obstruction to vision, and the men agreed that these goggles are the best they have ever used. There have been no cases of welders' flash.

Before the adoption of the clear glass various methods were in use to screen the lights, but these have been discarded, as they are now considered to be superfluous.

It is strongly urged that clear-glass goggles be adopted by all welders and their mates, as it has been proved that they afford complete protection from the distressing symptoms and loss of time caused by welders' flash. They are supplied by all manufacturers of protective devices, and the type of frame is a matter of choice. Splinterless glass is an additional protection against chipping.

[1] Proceedings of a Conference on Industrial Ophthalmology sponsored by the Columbia University College of Physicians and Surgeons in co-operation with the National Society for the Prevention of Blindness. Published by the Columbia University Press, 1947.

Dr. Robert Sutherland, medical adviser and secretary of the Central Council for Health Education, has recently returned from a two months' study tour in the United States of America, which he made under the auspices of the Rockefeller Foundation. He studied the teaching of public health in several universities and schools of public health, and health education practice in several areas. Dr. Sutherland also gave a number of lectures and participated in the Congress of the American Public Health Association.

Reports of Societies

BREECH DELIVERY

At a meeting of the North of England Obstetrical and Gynaecological Society held in the Liverpool Medical Institution on February 24, with the president, Mr. H. HARVEY EVERS, in the chair, Mr. L. W. Cox read a paper on the foetal mortality associated with breech delivery.

The results of breech deliveries at the Liverpool Maternity Hospital between 1933 and 1949 were analysed, and Mr. Cox pointed out that refinements in technique had brought about a consistent improvement. During the last five years only 12 infants were lost in 374 breech deliveries, a mortality of 3.2%. The mortality was high in babies weighing under 5 lb. (2.3 kg.) or over 9 lb. (4.1 kg.). Mr. Cox said that in hospital practice the mortality in multigravidae tended to be high because in many centres only unfavourable cases of breech presentation in the multigravida were referred for confinement in hospital.

Intracranial injury was still the most important cause of foetal death. The Liverpool Maternity Hospital figures showed that it was unfavourable for any breech cases to be delivered on the district. In ten years there had been 120 uncomplicated cases, and the foetal mortality was 20%. He stressed that all breech babies should be born in hospital. Whether external version should be carried out or not was a question which should be left to the individual operator.

This paper gave rise to some stimulating discussion. Mr. MARSHALL, of Liverpool, pointed out that the essentials of the Burns–Marshall method of delivering the aftercoming head were that the child should be allowed to hang and that traction should then be made on its legs and the trunk lifted upwards towards the mother. He allowed the child to remain hanging for only a short time, usually just long enough to allow him to rinse his hands in solution.

Pseudomucinous Cystadenoma of the Umbilicus

At the same meeting Professor T. N. A. JEFFCOATE described a case of pseudomucinous cystadenoma of the umbilicus. This condition was rare. His patient was a married woman who had been operated on in June, 1945, when her uterus, which contained many fibroids, had been removed. At the operation there was obvious endometriosis affecting the ovaries and the pouch of Douglas; the right ovary contained a tarry cyst, and during its removal some pseudomucinous fluid escaped in addition to the altered blood. Subtotal hysterectomy and removal of both appendages were carried out. Three years later the patient returned complaining of pain and swelling in the umbilicus. She thought that this small swelling appeared at monthly intervals, and when it came there was also some brown vaginal discharge. Two or three bluish cysts were seen, and a provisional diagnosis of endometriosis was made.

At operation a tumour which infiltrated the peri-umbilical tissues was discovered and was thought to be malignant in nature. It was fixed to the muscle and fascia of the abdominal wall. When the abdomen was opened a small cyst was found buried in adhesions between the bladder and rectum. Sections of the cyst and of the nodules in the abdominal wall showed the typical appearances of pseudomucinous cystadenoma. The epithelium was so active in some areas that it was classified as malignant. Presumably the original cyst of the right ovary was in part a pseudomucinous cystadenoma of low-grade malignancy which had recurred in the form of the pelvic cyst, situated possibly in a remaining fragment of ovary. From there metastases had formed in the abdominal wall. It was now eighteen months since the second operation and so far the patient remained well, although recently she had complained of attacks of abdominal colic. Cullen reported a similar case to this in 1922, but apart from that Professor Jeffcoate said that he had been unable to find any other cases in the literature. It might be, therefore, that the case he presented was only the second of its type to be recorded.

Correspondence

Psoriasis and the Adaptation Syndrome

SIR,—Selye's experimental results and the theory of "adaptation disease" appeared to be placed upon a firm basis by the clinical reports of the use of cortisone and A.C.T.H. in the treatment of rheumatoid arthritis, and now Barber, in his excellent review (January 28, p. 219), has added psoriasis to the growing list of non-specific diseases. May I, however, be allowed to attempt to refute any such conclusion, and may I add that some of the points raised apply with equal force to the problem of rheumatoid arthritis and the other diseases of adaptive origin?

Aetiology.—The search for an organism has so far been fruitless, but this, in my view, does not exclude such a cause. Failure may be due to a number of factors which are not taken into account when conducting our investigations. To mention but one, let us take a case in which the disease has been present for some time. It is possible that owing to the rapid destruction of the causative organism due to heightened body defence intensive search may fail to reveal its presence. Late syphilitic skin lesions, some cases of lupus, sarcoidosis, and lupus erythematosus are well-known examples. It is suggested, therefore, that renewed search in a series of cases examined as early as possible after the appearance of the first lesions is especially indicated. Yet failure in these conditions would not be final proof, since a general body defence to an organism set up before any skin manifestation may make this line of approach doomed to failure from the outset.

Again, it is curious how "streptococcal" infection has been so intimately associated with psoriasis and rheumatoid arthritis and how the great clinicians of the past held that somehow or other it was aetiologically significant. Barber notes how often it is present shortly before the original onset, especially in the widespread guttate type; and how often complications and spread follow the same infection, and he quotes a case of psoriasis arthropathica which was cured by the removal of an associated dental sepsis. He, however, places streptococcal infection in the vague category of "stresses," and at the same time mentions other infections—i.e., measles, pneumonia, and typhoid fever—as having a beneficial effect. According to the theory of adaptation disease streptococcal infection must lead to the over-production of salt-corticoids and the other diseases to the production of gluco-corticoids. Such a conclusion seems to me to merit our attention as much as the psychogenic origin of disease, which is so adaptable that it can bring about any and every result that for the moment is desirable.

How much more reasonable to assume that the streptococcus, so intimately and frequently associated with these diseases, acts through a mechanism so far obscure, but whose ability to produce a substance of such extraordinary properties as hyaluronidase give us hope that we may yet unravel the mysteries of the "streptococcal state." It may also be reasonable to assume that the theory of some hereditary or temporary lack in the target organs, as held by those who uphold the adaptive mechanism in order to explain the various disease syndromes, may be more readily explained by the facility afforded to various organisms to penetrate these different organs owing to the presence of this substance. That hyaluronidase may be of the utmost importance has been indicated by Selye,[1] since he quotes an unpublished article by Seifter, Baeder, and Dervinis, in which it is suggested that cortisone may act by virtue of its anti-hyaluronidase action.

Clinical.—The clinical varieties of psoriasis, especially the localized lesion which persists alone for years without any tendency to general spread, are wellnigh impossible to conceive as resulting from a general adaptive reaction: a locally acting cause is much more likely. The Koebner phenomenon, noted especially in psoriasis, lichen planus, and syphilis, is, in my view, further evidence of the infective origin of these diseases, since it illustrates the predilection of infections for injured tissues.

Therapeutic.—From the therapeutic aspect it is noted that Barber does not mention the astonishing effect of the local application of ung. hydrarg. ammon. dil. or a course of intravenous arsenic in some cases of psoriasis. The rapid clearance of the lesions, although followed later by relapse, is more in keeping with a focus of infection rather than an adrenal disorder. In this connexion it is well to remember Whitfield's experience with intestinal antiseptics. Rest in hospital is often the *sine qua non* in clearing an obstinate case, and experience of this type is often gleefully seized upon by those who stress the importance of psychical factors, but, like Father Brown's postman, the many normal physiological mechanisms (especially of the capillary system, which follow even slight changes in exercise and temperature) are always forgotten.

The beneficial effects of pregnancy and some infections on both psoriasis and rheumatoid arthritis do not, as Hench and his colleagues[2] state, militate against *an* infective origin, since syphilis, which is undoubtedly an infective disease, is also favourably influenced by pregnancy and, at a later stage, by infection—e.g., malaria.

A final point which has apparently been overlooked is that cortisone and A.C.T.H. are equally effective in diseases of adaptation. If adrenal exhaustion, due to stress, is the basic factor, then the giving of A.C.T.H. must of necessity be similar to the pastime of flogging a dead donkey. If adrenal lack is not the cause, then we must shift our point of failure to the anterior pituitary, which, so far as I can see, has not yet been granted pride of place.

Many other points will, I feel sure, have occurred to others which suggest that the value of Selye's work will lie in other directions and that diseases of adaptation will eventually be found to result from infection, but not in the simple direct way as it is understood to-day.—I am, etc.,

London, W.1. F. L. LYDON.

REFERENCES
1 *British Medical Journal*, 1949, **2**, 1129.
2 *Proc. Mayo Clin.*, 1949, **24**, 167.

Radiological Diagnosis of Pneumoconiosis

SIR,—It is difficult to see why Dr. A. T. Doig's plea (February 18, p. 437) for all the available evidence to be taken into account when assessing disability in the pneumoconioses should be regarded by Drs. C. M. Fletcher and P. D. Oldham as "rash" (March 4, p. 546). In my opinion Dr. C. Kelman Robertson (March 4, p. 546) puts the steps of the investigation in the right order of importance—viz., occupational history, clinical (including physiological methods), and *x*-ray examination. The mathematical examination of diagnoses by different observers confirms what we already know—that doctors vary in clinical acumen and experience. But if all three parts of the investigation are made thoroughly by doctors who have developed the clinical (and radiographic) instinct which comes from long experience, few serious mistakes will be made in the assessment of disability. No doubt errors and inconsistencies will occur, but it is probably too much to hope that disability arising from the pneumoconioses will ever be assessed with mathematical precision. In saying this, I do not mean that we should not go on trying to make our methods more accurate.—I am, etc.,

London, S.W.1. A. I. G. MCLAUGHLIN.

Caudal Analgesia

SIR,—Dr. T. C. Thorne's remarks (February 18, p. 414) on caudal analgesia are in accord with our experience, but he does not make it clear if he still recommends this method for prostatectomy. The intermittent method of caudal analgesia was tried by us for this operation over two years ago. The disadvantage was that relaxation was inadequate, so that either a field block had to be used or, as Dr. Thorne remarks, "moderately deep general anaesthesia." With the latter bleeding was always difficult to control—a special disadvantage with

the modern methods for prostatectomy. Moreover, the effect on the blood pressure of the sacral block was unpredictable.

It seemed to us very much simpler to adapt the method of Frankis Evans and use an intrathecal block up to D10 and have perfect control of the blood pressure with a 1 to 250,000 adrenaline drip.[1] Our observations show that if the blood pressure is allowed to fall or remain low for any period during this operation it is always to the detriment of the patient.—We are, etc.,

T. CECIL GRAY.
R. MARCUS.

Liverpool.

REFERENCE

1 Marcus, R., and Gray, T. C., *Brit. J. Anaesth.*, 1949, **21**, 182.

Wassermann and Kahn Reactions

SIR,—Comparisons between such widely used standard tests as the Wassermann and Kahn reactions are always interesting, and it is therefore to be regretted that Dr. T. E. Osmond (March 4, p. 524) had not gone further and compared agreements and discrepancies between the tests in the several groups of his patients. If this is done a most striking degree of agreement is evident in the group showing most homogeneity. For example, with voluntary blood donors tested at the North Middlesex Hospital between 1946 and 1949 the figures were as follows:

Parallel Tests	*Agreements*	*Discrepancies*	
		Minor	*Major*
4850	4833 (99.65%)	12 (0.25%)	5 (0.1%)

An equally striking increase in the discrepancies is noted in venereal cases undergoing treatment. Figures compiled from tests carried out on men under treatment at R.N. Barracks in 1942–3 were as follows: parallel tests 329, agreements 291 (88.4%), minor discrepancies 25 (7.6%), major discrepancies 13 (4.0%).[1] In the period during which Dr. Osmond carried out his tests (June–September, 1949) penicillin treatment, with or without arsenicals, was established, and further discrepancies, with the Kahn test dominant, can be observed in cases so treated. For example, figures compiled from tests carried out in men under treatment at an R.N. Hospital in 1945 were as follows: parallel tests 846, agreements 648 (76.61%), minor discrepancies 131 (15.46%, Kahn dominant in 12.62%), major discrepancies 67 (7.92%, Kahn dominant in 7.21%).

We first observed this increase in discrepancies, with Kahn dominance, soon after the introduction of penicillin therapy in syphilis, and investigation then showed this to be due to (1) the more rapid and clear-cut reversal of both serological reactions in penicillin treatment; (2) an increase in the disproportionate rate of reversal of the reactions, the positiveness of the W.R. being brief or scarce, developed compared with the duration of the positiveness of the Kahn test; and (3) the more frequent tests being made during treatment, now including the period of maximal discrepancy between the results of the reactions.

It would have been interesting to learn from Dr. Osmond if, among his V.D. cases, major discrepancies between the tests persisted for any length of time. In our naval series we observed Kahn-positive major discrepancies to persist for as long as three to six months. The agreement of the tests in general hospital wards is given by our R.N. Hospital series (1937–45): parallel tests 17,496, agreements 17,047 (97.43%), minor discrepancies 361 (2.07%), major discrepancies 88 (0.50%).—We are, etc.,

J. F. HEGGIE.
R. M. HEGGIE.

London, N.18.
Northampton.

REFERENCE

1 Heggie, J. F., Maguire, J. G., Bull, M. M., and Heggie, R. M., *Lancet*, 1947, 1, 588.

SIR,—I was interested in Dr. T. E. Osmond's article (March 4, p. 524), having myself made observations on the same comparison not very recently (*British Medical Journal*, 1929, **2**, 602). I also found that the two tests should be performed simultaneously on all specimens of sera submitted. I found also that the Wassermann reaction became positive first in primary syphilis, the Kahn test altering to positive some weeks later. In treated cases the Wassermann became negative first, the Kahn test altering to negative some weeks or months later. I found both reactions highly specific.—I am, etc.,

FRANK MARSH.

Epping, Essex.

Vitamin C and Benzene Poisoning

SIR,—May I be allowed to add a few belated remarks to the subject of vitamin C and benzene poisoning discussed recently in an annotation (December 31, 1949, p. 1520) and to Dr. Catherine Swanston's letter (January 28, p. 251) alluding to the prevention and treatment of poisoning due to trinitrotoluene by giving ascorbic acid? Poisoning with T.N.T. presented a serious problem in the first world war, and in 1917 a balanced diet was formulated and given to employees in an ordnance factory in England because it was found that many workers (especially female, were showing a high incidence of gastro-intestinal disorders.[1] This was not in the nature of a scientific experiment, because no controls were used.

With the outbreak of the second world war work on the relationship between diet and the aromatic hydrocarbons was intensified. I should be inclined to interpret Professor Lane's statement (quoted by Dr. Swanston), that the treatment of toxic jaundice included "a high carbohydrate diet low in fat with a high vitamin B and C intake," to mean, simply, a well-balanced diet (including also an adequate protein percentage), which should be given long before toxic jaundice becomes manifest in order to protect the liver cells. Many other signs and symptoms must surely be noted before the advent of toxic jaundice.

Haemorrhagic manifestations in chronic benzene poisoning appear long before the condition of aplastic anaemia (which is already an advanced stage of the disease), and because such signs and symptoms resemble scurvy ascorbic acid was recommended for the prevention and treatment of benzene poisoning. Even before the outbreak of the war in 1939 benzene and its homologues began to assume great importance because of their spreading use in industry, and much research work was undertaken. This was intensified during the early war years.

The indications are that prolonged contact with benzene is followed by a decrease in the urinary excretion of ascorbic acid, a fall in the leucocyte count, and an increased fragility of the erythrocytes. There appears to be more than a little scientific evidence that the intake of vitamin C by workers exposed over long periods to benzene brings about an increased urinary concentration of ascorbic acid and a blood picture which more approaches the normal. Thus it might appear that an extra supply of vitamin C gives an increased resistance to those workers more prone to the toxic effects of benzene.

The position at present appears to be that, while in general factory workers in the United Kingdom, the Continent of Europe, and the United States of America are recommended a higher intake of vitamin C, authorities seem hesitant to commit themselves to categorical statements that vitamin C is a prophylactic against benzene poisoning. This attitude was given credence recently when two authors of textbooks on industrial medicine were asked to give their opinions on the value of vitamin C in relation to benzene toxicity. Despite the fact that both state in their books that vitamin C is generally recommended, they both gave not only evasive replies but even intimated that it might be dangerous to give vitamin C to workers coming into close contact with benzene because it may induce a false sense of security, and they recommended the universally known methods of ventilation and good housekeeping. It is not easy to agree with this "heads I win, tails you lose" attitude, and perhaps a more satisfactory and even scientifically sound approach would be to allow a higher intake of vitamin C, provided that the rest of the diet is balanced, ordinary factory hygiene is observed, and a regular routine monthly examination with special reference to the blood picture is made, so that any abnormalities can be detected in their early stages.—I am, etc.,

JOSEPH B. LURIE.

Johannesburg.

REFERENCE

1 Viscount Chetwynd, *Proc. R. Soc. Med.*, 1917, **10**, 6.

Pain Simulating Heart Disease

SIR,—I read the articles of Dr. A. Rae Gilchrist (February 11, p. 327) and Dr. D. Rhodes Allison (p. 332) with interest. Both deal with the sometimes difficult differential diagnosis of intrinsic (or organic) and extrinsic heart pain. The former author states that it is most important to pay close attention to the patient's own account of the details of his difficulties. The latter is of the definite opinion that pain induced by excitement and anger is most unlikely to be of chest-wall origin, which in his opinion is a most important differential point. Both statements appear to be open to controversy. In my experience these subjective signs and complaints cannot be relied upon as a basis of an exact diagnosis. In scientific medicine it must be our endeavour to base the diagnosis on objective criteria as far as possible. Actually this is possible in regard to extrinsic cardiac pain.

Under the term "idiopathic myalgia" a frequent muscular disease—not "fibrositis"—was described which mimics visceral and nervous diseases, especially also a cardiac lesion.[1] In the majority of cases the muscle giving rise to heart pain is the pectoralis major. In a few cases the dorsal part of the sacrospinalis causes pain referred to the heart.[2] The characteristic "myalgic spots" present in idiopathic pectoral myalgia are located at the origin of the sternocostal portion of the muscle close to the sternum in the 3rd–7th intercostal spaces. The myalgic areas can be, and have to be, objectively localized by the fact that on pressure an involuntary, reflex-like movement is elicited in addition to agonizing pain. This sign is pathognomonic.

The diagnosis of pectoral myalgia responsible for the complaint of heart pain can be further confirmed by procaine injection, which relieves it almost instantaneously. In this way procaine, if *each* myalgic spot is accurately and thoroughly injected with 1–2 ml., can be used as a most reliable differential diagnostic test. A point of great scientific as well as practical importance is that even in cases of typical angina of effort an idiopathic pectoral myalgia may be responsible for the symptom of pain, as proved by the permanent relief obtained by procaine injection. This fact is not as surprising as might appear, since pain is a frequent but not an indispensable sign of organic cardiac lesions. If this fact that idiopathic myalgia is present in and responsible for extrinsic cardiac pain is kept in mind it will be possible to confine the diagnosis of heart lesions to those patients who are in fact organically ill.—I am, etc.,

London, N.W.11. M. G. GOOD.

REFERENCES
1 Good, M. G., *Lancet*, 1940, **2**, 326.
2 —— *Brit. J. phys. Med.*, 1938, n.s. **1**, 302.

SIR,—Dr. D. Rhodes Allison in his most timely and helpful article "Pain in the Chest Wall Simulating Heart Disease" (February 11, p. 332) made one important omission. That is, in quite a fair number of cases of fibrositis of the chest wall the pain is relieved by trinitrin tablets (gr. 1/100=0.65 mg.) within sixty seconds or less, when sitting or standing still. The fact that trinitrin relieves the pain is likely to confirm the diagnosis of angina of effort.

In a paper entitled "Cure or Relief of Cases Misdiagnosed Angina of Effort" (*Journal*, 1938, **2**, 891) I pointed out that some cases of fibrositis of the chest wall mimic angina of effort very closely and are relieved by trinitrin. If a tablet is taken before walking it prevents the onset of pain. Emotion or excitement may bring it on; even a painfully full bladder may do so. The pain at times is sufficiently severe to cause sweating and is more likely to come when walking after a meal and against a strong wind.

Two cases seen in 1936 and described in the paper mentioned above were both seen by the same cardiologist. In neither of them was a diagnosis of fibrositis made. The first patient was taking nine tablets of trinitrin daily, but after five days of deep massage he could manage with one tablet a day. He is now in his 75th year and averages two tablets a day. This case happens to have fibrositis all over the body. The second patient is still alive and is in his 79th year. He is working six days a week. In this case the cardiologist made a firm diagnosis of angina of effort. I gave him 16 treatments of deep massage, and after six months he went ten years without requiring any trinitrin tablets; before that he had been taking three or four a day.

To forget the fact that certain cases of fibrositis of the chest wall are relieved by trinitrin tablets might lead to a diagnosis of angina of effort, which would be most serious for the patient and his relatives.—I am, etc.,

London, W.5. R. HALSTEAD DIXON.

Hypersomnia Syndromes

SIR,—There is an increasing tendency for medical writers to attempt to prove that those whose names are always associated with certain syndromes were not in fact responsible for the original description, or, alternatively, that they were describing something else altogether. The latest assault is made upon the Kleine–Levin syndrome of "periodic somnolence and morbid hunger," by Dr. M. N. Pai (March 4, p. 522), who has studied a series of similar conditions and concludes that the association of the two features is incidental and the aetiology hysterical.

We must be grateful to Dr. Pai for sounding a note of warning regarding this condition, and as he gives very few details of the clinical and psychiatric findings in his cases we must accept his conclusions in respect of his own series. But are his grounds adequate for condemning all other authors' cases as hysterical? Perhaps he has reasons other than those he quotes, but he does not say so. To take two examples: Levin's Case 6 "talked and laughed in his sleep." If this proves him to be neurotic the main ward of any neurological unit must be filled with neuroses. Dr. Critchley and Dr. Hoffman's cases are said to be obviously psychogenic because Case 1's "first attack began when he was working in a rather uncongenial job on radio research." These seem to me insufficient data on which to base a diagnosis of neurosis or hysteria.—I am, etc.,

Birmingham, 15. EDWIN R. BICKERSTAFF.

Brachial Plexus Block

SIR,—With reference to an article by Dr. S. V. Humphries on brachial plexus block (January 21, p. 163), we would like to make the following comments.

During the last 22 months since the opening of Baragwanath Hospital over 1,000 brachial blocks have been performed, and we have found this method extremely useful. Our indications were the following:

1. Where surgical interference is indicated immediately and the patient has a full stomach or is intoxicated.
2. When prolonged operation such as multiple tendon suture, is contemplated.
3. Where other conditions, such as chest complications, are present.
4. On occasions when there is a shortage of anaesthetic staff and more than one operation has to be performed at once.

Our technique has been that of producing paraesthesia with the injecting needle prior to any injection of fluid being made, except for the skin weal. Our landmarks are as described by Macintosh and Mushin, but our technique varies, in that we palpate the subclavian artery and insert our needle just lateral to it and invariably produce some paraesthesia. If paraesthesia is not obtained the needle is reinserted.

Our fluid for injection has been in all cases amethocaine hydrochloride 1 : 1,000 with adrenaline. Our average volume is about 60 ml., but this varies with the duration of anaesthesia required. With 100 ml. of the above solution we have had anaesthesia up to 5 hours. We have found that amethocaine hydrochloride gives a considerably longer period of analgesia than does procaine, and has the added advantage of being lethal for non-sporing organisms. We have not had any untoward symptoms developing with the quantity we use and have not had any irritant effect on the tissues.

We would also like to stress the necessity for some form of sedation following the block, especially in young children and nervous and uncooperative patients. It is extremely important, however, to give the sedative after the block has been performed. If it is given prior to the block it makes the procedure more difficult and less certain, in that the patient is drowsy and will not respond as readily to any sensation in the arm. We have

found that a combination of pethidine and scopolamine (average adult dose 100 mg. and 0.4 mg. respectively), given intravenously after the block, is very satisfactory—especially so in drunk patients, where it has been suggested that alcohol acts as a synergist to the pethidine and scopolamine—and very good sedation is obtained. We would also like to emphasize the necessity of putting the affected limb into a sling after operation, as temporary paralysis is extremely common with brachial plexus block.—We are, etc.,

D. C. DEVITT. M. FRIEDLANDER.
M. S. KRAMER. L. VAREGES.
J. G. W. SUTHERLAND. J. ROSENBERG.
Baragwanath N.E. Hospital, Johannesburg.

Malignant Tertian Malaria

SIR,—I cannot allow Dr. N. McLean's remarks (January 21, p. 189) to pass unchallenged. I agree that malignant tertian malaria in the adult African is not a serious disease, and some writers doubt if it plays a great part in the high infant mortality in Africa. However, a medical officer whose experience is confined to Africa cannot realize the blessing of Sir Philip Manson-Bahr's excellent descriptions of pernicious attacks of malignant tertian malaria to an inexperienced medical officer in charge of aggregations of coolie labour or of recruiting areas in Central India. In these cases malaria could be, and was, a medical emergency of the utmost gravity, and an Indian complaining of mild headache and slight fever in the morning might be dead by evening. Intravenous quinine was indeed a life-saving procedure in these cases, and there are few conditions in medicine which require such urgent treatment and respond so dramatically. It is also of interest to note that West African troops suffered considerably when attacked by benign tertian forms of the malarial parasite in Burma, and although their condition never gave rise to anxiety some form of antimalarial therapy was indicated and 10 gr. (0.65 g.) of aspirin, which may be the only form of treatment indicated in West Africa, was certainly insufficient in Burma. If Dr. McLean's remarks apply to Africa alone there is some justification for them, but if to "the Tropics" I cannot agree that the practitioner should not be "confused and bamboozled" by classical descriptions of M.T. malaria.—I am, etc.,

Accra, Gold Coast. G. M. EDINGTON.

Side-effects of Proguanil Therapy

SIR,—The literature on the use of the antimalarial drug proguanil emphasizes its non-toxicity over a wide therapeutic range. In view of this I thought that my recent personal experience of the drug might be of interest.

Having had two or three slight attacks of malignant tertian fever over the past two years, I decided that a resolute effort was indicated to stamp out the infection. I therefore recently embarked on a course of proguanil of 400 mg. daily for fourteen days. During the first week of the course I was three times wakened during the night by a carotid sinus reflex action. In the first instance the left side of my face was numb, and the other times my mouth was in tonic spasm. Each time the numbness and spasm were immediately relieved when I moved my head from the contorted position which was evidently causing pressure on the sinus. By the ninth day of the course I had a constant dizziness and also slight tingling in the little and ring fingers of the left hand. I therefore considered it was time to stop the drug.

The dizziness, with occasional headache, continued for over a week after ceasing the drug. The tingling in the left hand spread to the other fingers and was made worse by pressure on the median and ulnar nerves in the forearm. Aching pain in the hand and fingers was also caused by this pressure. Similar, but less severe, tingling and pain were caused by pressure on the nerves in the right forearm and on both sciatic nerves. Nowhere could I detect any weakness, wasting, or fibrillation of the muscles. The reflexes were all present and equal. There was no disturbance of sensation. These symptoms were most severe about seven days after stopping the drug and now, after fourteen days, have almost disappeared.

A hypersensitive carotid sinus may be associated with hypertension, and it is interesting to note that guanidine compounds, of which proguanil is one, have been found to cause hypertension when injected into animals. Unfortunately I did not discover this fact until three days after stopping the drug, when my blood pressure was not significantly raised. However, I suppose the hypersensitivity of the carotid sinus reflex would be a local toxic effect, as, presumably, was the peripheral neuritis.

It seems evident that the proguanil must have been responsible for these symptoms and that it cannot therefore be regarded as completely non-toxic to man. I admit that most authorities recommend only 300 mg. daily up to ten days, and some say that even less will suffice to eradicate the infection, whereas I was taking 400 mg. daily. It may be also that I was in some degree sensitive to the drug.—I am, etc.,

London, S.W.1. V. L. BILLINGTON.

Fifty Years of Medicine

SIR,—May I make an addition to the account of developments in psychiatry in your issue "Fifty Years of Medicine" (January 7, 1950)? When going through the old records of Lachlan Park Hospital I found that "electrical treatment" was being used for the insane, starting in 1851. The old records—i.e., case history books—note the application of what is varyingly described as "electricity," "galvanism," and the "galvanic battery" to patients. There is still in existence a static electrical machine, Leyden jar, stool with glass legs, etc., which must have been the source of the electricity. And they got good results.

Unfortunately there is no record of the technical details, but the good results were on patients with histories fairly typical of catatonic schizophrenia: they had not spoken for many months, stood motionless most of the day, were liable to sudden outbursts of violence, and showed other characteristic symptoms. Also the onset had been in early adult life. These patients improved dramatically for a while and then relapsed, to improve again on further treatment. This type of treatment was used for just over 20 years.

In the hospital library there is a copy of *The Cyclopaedia of Practical Medicine*, edited by John Forbes, Alexander Tweedie, and John Connolly (1833 edition), which describes the treatment of physical disease by electricity, the machine and accessories being similar to the one found here, but there is no reference to the treatment of insanity by this means. I would be most interested to hear from anyone who could throw further light on this precursor to Meduna's work.—I am, etc.,

Lachlan Park Hospital, New Norfolk, Tasmania. G. M. CRABBE.

Microscopical Examination of Faeces

SIR,—Dr. Constance A. C. Ross's interesting paper (February 25, p. 465) adds further evidence to a fascinating problem of infant nutrition. The preservation of a Gram-positive *bifidus* flora in the lower intestinal tract of young infants may be regarded as a safeguard of health. Any shift to the Gram-negative flora, which usually is preceded by changes in the *p*H of the faeces, implies disturbances of the intestinal function and the potential danger of endogenous infection.

The direct microscopical examination of the faeces has been a routine procedure in the children's department of the West Middlesex Hospital for some years, providing a reliable guide in the assessment and treatment of gastro-enteritis. Prophylactically it has been used with advantage in testing the adequacy of individual feeding formulas in artificially fed babies during the first three months of life, especially in prematures who, even when fed on expressed breast milk, are liable to develop a predominant Gram-negative flora and fail to thrive. The conversion into a *bifidus* flora achieved by dietary correction eradicates all abnormal symptoms.

Much research has been done with the aim of finding a feeding formula that promotes conditions in the intestinal tract favourable for the growth of the *Lactobacillus bifidus* so easily achieved by breast feeding. However, the results have not gained much popularity, as formulas have been too complicated

and often refused because of their taste. Recently Petuely[1] published a preliminary report on the discovery of a "*bifidus* factor" of a yet undisclosed nature. The addition of 10 mg. of this substance to the total daily formula is said to produce a predominant *bifidus* flora in healthy artificially fed infants within 24 to 36 hours and stools with the distinctive quality of breast-milk stools of a *p*H of 5.0 to 5.6 (usually 5.2). Neither an inhibition of the growth of other intestinal bacteria nor a bactericidic action could be proved *in vitro*. Therapeutic trials on these lines are in progress in acute and chronic gastro-intestinal disorders.—I am, etc.,

Isleworth, Middlesex. M. DYNSKI-KLEIN.

REFERENCE

[1] *Ann. Paediatr., Basel*, 1949, **172**, 183.

Night Cramps and Quinine

SIR,—In your annotation on the value of quinine in night cramp (February 25, p. 478) you state that Harvey's observations establish beyond doubt that it has a rational basis. Evidence on an experimental basis was revealed to me after reading a year or two ago in a book on shooting that an infallible remedy for cramp after a hard day's walking over rough ground was "5 gr. (0.32 g.) of quinine washed down with a whisky-and-soda at bedtime." As a sufferer from severe cramp in the calf and peroneal muscles after hard exercise, I tried both remedies, and with complete success.

This result was all the more satisfactory to me because the cramp was always on those cold nights in winter when sleep is so enticing and gymnastic exercises to relieve the spasm so uninviting. I don't know why I had not tried the remedy before, since a young relation of mine was very quickly relieved by taking quinine three times a day for cramp following thyroidectomy for acute Graves's disease.—I am, etc.,

Woodhall Spa, Lincs. LEONARD BOYS.

Erythema Nodosum

SIR,—I have read with great interest the article of Dr. S. A. Doxiadis (October 15, 1949, p. 844) and the comments published in the *Journal* since. The number of cases I have met in hospitals in this country is very small, but I have seen and investigated a large number in Vienna, where erythema nodosum seems more common, and my conclusions were quite similar to those of Dr. Doxiadis.

In children's hospitals and out-patient clinics these tuberculin tests were made on admission or at the first attendance, and at regular intervals afterwards as a matter of routine. In all the children I have seen there who had negative tuberculin tests (Pirquet's cutaneous test and the Mantoux test) before the occurrence of erythema nodosum the tests after the onset of erythema nodosum appeared positive. It also struck me that in most cases no other signs of a primary tuberculous infection were found on physical examination, but in almost all the cases *x*-ray examination revealed hilar glands, some opacity of the hili, and in subsequent examination some months later also a primary (Ghon) focus.

The connexion of erythema nodosum with a positive tuberculin test left little doubt about its nature, and erythema nodosum was considered as an allergic reaction to toxin of the tubercle bacillus, indicating a primary tuberculous infection. But it is only by thorough clinical examination (*x* ray, B.S.R., temperature chart) during and after the onset of erythema nodosum that its aetiology can be ascertained.—I am, etc.,

Wembley, Middlesex. S. P. BARTFELD.

SIR,—Dr. H. S. Gaskell (February 11, p. 375) has denied that there is any relationship between primary tuberculous infection and erythema nodosum. I have seen three children with erythema nodosum in the past six months, and in two of them there was conclusive evidence of tuberculosis, as the following notes will show.

A child aged 2 years had had no known contact with tuberculosis. Erythema nodosum had appeared five weeks previously. The child was pale and irritable, and cough, lassitude, and poor appetite were present. The tuberculin test was positive. A skiagram showed marked enlargement of the hilum of the right lung with collapse of the middle lobe.

A child aged 5 years was a contact of his mother, who is an open case of pulmonary tuberculosis. Erythema nodosum had appeared three weeks previously. He was pale and thin. The tuberculin test was positive. A skiagram showed enlargement of the hilum of the right lung with collapse of the middle lobe.

There was no evidence of tuberculosis in the third of the children.

In this connexion it is apt to quote Hurford's recent remarks on the diagnosis of respiratory tuberculosis in childhood: he writes that erythema nodosum may signify the arrival of allergy, especially after infancy. All this evidence supports the orthodox view of the aetiology of erythema nodosum, which is that it is intimately related to tuberculosis. Its occurrence should cause the practitioner to think first of a primary tuberculous infection and to take the necessary steps to find it if present.—I am, etc.,

Belfast. H. G. CALWELL.

REFERENCE

[1] *Bull. nat. Ass. Prev. Tub.*, 1950.

An Unusual Murmur

SIR,—I have followed the correspondence on this subject and should like to add some notes from my experience which may possibly give a new aspect to this very interesting sign. In 1928 I described in the Polish journal of forensic medicine two extremely rare cases of the rupture of the papillaris muscles of the mitral valve which I had discovered during post-mortem examination.

In one case the whole papillaris muscle at its base was ruptured, and half of the mitral valve was hanging free. In the second case some parts only of the muscles connected with the chordae tendineae were torn. In both cases the torn parts of the muscles hanging from the chordae tendineae were wound several times between the tendinous strings. This was obviously caused by the blood stream. The corresponding part of the mitral valve was hanging free, causing heart failure. Neither patient had been examined by a doctor at the time of the rupture, as death followed too quickly, and therefore a post-mortem examination was necessary to ascertain the diagnosis. When I described the above cases only a very few had been reported in the literature—seven, if I remember rightly. The first was described in the French medical press at the beginning of the nineteenth century. In some cases the death did not occur suddenly, and the symptoms and signs were described. The most prominent sign was a very loud cardiac murmur which was easily audible at a distance from the patient.

It is probable that even one or two ruptured chordae tendineae with fragments of muscle may cause a loud cardiac murmur. In such cases the valvular insufficiency may not be very serious, so the patient can survive it, and when the freely hanging chordae become fixed by being entwined with other tendinous strings the murmur might disappear. Therefore I think that the rupture of the papillaris muscles, though a very rare occurrence, should be taken into account in the differential diagnosis of cases with loud cardiac murmur.—I am, etc.,

London, W.3. C. UHMA.

Gastric Surgery in the Last Half-century

SIR,—In the course of his admirable account of the above (January 28, p. 206), Sir James Walton mentions the word "radiograph" once, pleading for a clear clinical history, but early carcinoma of the stomach is symptomless. Even the late Lord Moynihan's dictum of the four losses—of interest in life, appetite, blood (anaemia and occult blood), and of weight—is becoming outdated, especially the last. Rigler, of the University of Minnesota, is probably going too far in advocating wholesale gastric radiology on the line of mass radiology for tuberculosis, but it serves to emphasize the clinical difficulties.

Radiology may be more than the handmaiden of the gastric surgeon; no other organ lends itself better to this method of diagnosis. Early on the organ becomes lazy. *X* rays are capable of differentiating between the relatively benign hypertrophic form, the ulcerative type, the one-time inoperable

"leather-bottle" organ, and that involving the cardia (all these are featured in *A Descriptive Atlas of Radiographs*, London, 1949). They reveal the all-important question of adhesions. It must be a comfort for the surgeon to have his fears confirmed by *x* rays and to know beforehand what type of cancer he is likely to find. *X* rays are also valuable in study of the complications of gastric surgery, particularly gastro-jejunal ulceration.
—I am, etc.,

Birmingham. A. P. BERTWISTLE.

SIR,—In the article entitled "Gastric Surgery in the Last Half-century," by Sir James Walton (January 28, p. 206)—especially interesting for old-timers like me—I regret to find the name of one of the pioneers of gastric surgery mutilated. May the famous author of the article kindly excuse me if I rectify this as a duty to the history of medicine. The name of the surgeon of the Viennese school, and later head of surgery in Prague, who performed the first gastro-enterostomy was not Wolfer, but Wölfler (=Woelfler), who, by the way, performed this operation in 1881. Maybe, being nearer to the time and locality of this event when a student, the mis-spelling struck me more.—I am, etc.,

Trinidad, B.W.I. E. MARCUS.

An Appendicular Faecolith

SIR,—As no reference could be found in the literature to an appendicular faecolith showing up on a radiograph and as I have not been able to find anyone who has seen one before, I feel perhaps that the following case is of interest.

A woman aged 45 had suffered from right-sided abdominal pain from time to time for very many years. During the last four months the pain had been more or less continuous and at times quite severe. She had been seen on several occasions by her doctor, who had suspected appendicitis but had always found her afebrile. On examination there was a slight fullness of the right side of the abdomen, with resistance and tenderness rather high for an appendix, rather low for a gall-bladder, and rather far forward for a kidney.

X-ray examination of the abdomen showed a clear-cut, bullet-shaped shadow, ¼ by ¼ in. (1.25 by 0.6 cm.) approximately, lying just above the centre of the iliac crest on the right side. This was diagnosed by the radiologist as a calcified mesenteric gland. Cholecystogram and pyelograms were normal. On September 1, 1949, I removed her appendix, which was retrocaecal, necrotic, buried in a dense mass of fibrous tissue, and which contained the faecolith. She made an uninterrupted recovery.

—I am, etc.,

Rotherham. ERIC COLDREY.

Occupational Tumours of the Bladder

SIR,—Your annotation on the subject of occupational tumours of the bladder (February 25, p. 476) remarks that it should not be too much to hope that the ideal of complete enclosure of hazardous manufacturing processes will be achieved in time. As a chemist I feel that it is too little appreciated that conditions at present are such that the hazard during normal production is fairly low, and that the main risk of exposure to carcinogenic or other toxic substances arises when mechanical breakdown of plant occurs and repairs have to be undertaken. In such cases complete protection of the workman is an extremely difficult matter, even if the plant be completely enclosed, because a "no-touch technique" is hardly applicable.
—I am, etc.,

London, S.W.7. J. DEREK RICHARDSON.

Sadism on the Screen

SIR,—May I refer to Dr. Clifford Allen's letter under this heading (March 4, p. 553)? Once again the film is being made the scapegoat for almost all the ills which beset the adolescent. Dr. Allen in his interesting letter mentions that offences of violence against the person increased from 1,583 in 1938 to 2,459 in 1945. Dr. Allen assumes that this increase is due to gangster films. There are two answers to this assumption, which I think demolish it.

One is that between 1938 and 1945 there was a world war in which very many thousands of children did not have the benefit of parental, and especially masculine parental, control. Surely this must have had some deleterious effect upon the behaviour of the child. In addition to this, I think Dr. Allen will probably agree that one of the inevitable by-products of war, as inevitable as that of wounds, is a general lowering of standards of morality. This again cannot fail to have its effect upon the young. It took some time for the nation's social body to recover after the 1914–18 war. The last war was of longer duration and deeper in its effect. Therefore the recovery must be correspondingly slower and more difficult.

The second point is that during the period between 1938 and 1945, especially during the war years, the vast majority of films were concerned, in one way or another, in maintaining the people's morale, or being frankly amusing and entertaining. If there has been—and I do not admit it—an increase in the gangster type of film, it has been since 1945 and not before then.

Dr. Allen then quotes the increase in the number of arrests for indictable offences by offenders under 21 in 1948. On this point may I quote the *News Chronicle* of March 6:

"Sir Harold Scott, one of the most thoughtful men who has ever occupied the office of Metropolitan Police Commissioner, has put on record his opinion that crime among youth in this country is mainly caused by a bad atmosphere in homes. It is no accident that in recent years cases of child neglect have been just as prominent as those of juvenile crime. The two are parallel problems. . . . To regard young hooligans as more sinned against than sinning would be sentimental and foolish. They must be punished hard. But the sins of the fathers are very often visited upon the sons."

Dr. Allen further states, "Recently I saw a trailer advertising the next week's film which stated that it showed 'exquisite cruelty in kid gloves.'" Nothing is more fallible than human memory, and I would be very glad if Dr. Allen could give me the name of the film to which this trailer referred.

Dr. Allen refers to the "grandmotherly Hays Office." What do critics of the film industry want? If there was no attempt on the part of the industry to regulate itself and to provide a code of conduct for itself our critics would become Stentors in their condemnation of the film industry's lack of responsibility. When, however, the industry produces a code, as the American film industry has done, then our critics call it grandmotherly regulation. It seems you cannot please the critics any of the time.

Dr. Allen then continues to say that this self-imposed regulation by the American industry "makes everything (except violence) subject to the censor." I am afraid Dr. Allen has never seen a copy of the Production Code Administration of the Motion Picture Association of America, which expressly prohibits "brutality" and even "apparent cruelty."

When I was a small boy all youthful delinquency was laid at the door of either the "penny dreadful" or the music hall. Now all the blame is put upon the film industry and/or radio. May I quote Sir Cyril Burt, Professor of Psychology at University College, London? In his study, *The Young Delinquent*, Sir Cyril states:

"The cinema has been freely censured and abused for stimulating the young adventurer to mischief, folly, and even crime. Perhaps no one is so eager to advocate this view as the young culprit himself, who frequently sees in such a derivation of his deeds a chance to deflect blame from his own moral laxity to that of the producer of the film. For the steady and the healthy-minded the cinema supplies an alternative, and not a provocative, to mischievous crime."

Winifred Elkin, the well-known British sociologist, in her book *English Juvenile Courts*, states:

"Emotional unhappiness is among the most potent causes of juvenile delinquency. It is the unhappy child who is most likely to seek forgetfulness in the cinema. Parents prefer to lay blame for failure on some outside agency, and the cinema is a convenient scapegoat."

In conclusion, I would like to say that a child who has suffered from the confusion of his parents or from strife in the home, from rejection, from the lack of a wholesome recreational outlet, from poor housing, or some other frustrating experience, may readily be influenced by a film. But I feel the basic cause of the delinquency that we are experiencing to-day is that family

group living is one of the casualties of modern life. By reconstituting it on a firm Christian basis we shall give strength to our children in meeting the hazards of life, and there will be no need or temptation then to blame the films and/or the radio or even the comic strips.—I am, etc.,

A. R. THORNTON,
Director of Information,
Motion Picture Association of America, Inc.

London, W.1.

SIR,—May I support Dr. Clifford Allen's protest (March 4, p. 553) against sadism on the screen? This form of entertainment is by no means limited to the gangster films but occupies an alarmingly large space in such "innocent" productions as Walt Disney's cartoons. Do your readers remember his rendering of "Snow White," where a skeleton could be seen mouldering away in a dungeon stretching out its arm through the bars with the water jar just out of reach, or the scene of a child lost in a wood at night with the branches trying to grab it from all sides? Needless to say these extras have nothing whatsoever to do with the story but are put in as special sadistic touches.

But what can we expect at a time when a book can be advertised in one of the leading literary reviews as "a really coruscatingly decadent first novel, full of deliciously expensive and sophisticated adolescent frustration. . . ." The author of this panegyric would probably say he had been writing with his tongue in his cheek, but he and the publisher must have been quite well aware of the effect this kind of writing would have on the general public. Any psychologist who has the courage to oppose this pandering to the public's lowest and most antisocial instincts deserves all the support we can give him.—I am, etc.,

E. ELKAN.

Pinner, Middlesex.

Definition of Senility

SIR,—In the *Journal* of November 19, 1949 (p. 1179), you published a letter from Mrs. M. H. Hill, who suggested that some clarification was needed in the use of the words "senile" and "senility" by members of the medical profession and others. This letter has led to one interesting reply, from Dr. W. A. O'Connor (December 3, 1949, p. 1297).

We are, however, anxious that the medical profession should give some attention to the meaning of this word when used, for instance, on medical certificates provided for the information of those accepting old people as residents in homes. It has been found by experience that there is a wide divergence of meaning attached to this word, ranging from senile dementia to someone who is merely a little frail through extreme age.

There is the wider aspect also that it would appear that the term "senile" is being used rather more freely than is desirable; the old people of to-day tend to resent even the word "old," shrinking from the word "senile," which to them at any rate always indicates some form of mental instability. We would be very grateful if a correspondence could be initiated in these columns and if some uniformity could be agreed upon by the medical profession on how this word should be used in medical terminology.—I am, etc.,

FRED MESSER,
Chairman, The National Old People's Welfare Committee.

London, W.C.1.

POINTS FROM LETTERS

Psychiatric Terminology

Dr. J. B. GURNEY SMITH (Epsom, Surrey) writes: I should be glad of psychiatrists' observations on a new term that presented itself to me in a flash a little time ago, to cover all the stigmata of mental deterioration and degeneration. It is the word "psycholysis." It seems to me to be quite as expressive and more convincing than the old hackneyed term "dementia." If one can refer on the physical plane to such events as pneumolysis, fibrinolysis, haemolysis, etc., I feel that mental break-up can be quite well assessed by the term "psycholysis" and would be etymologically correct. I feel some standardization of psychiatric terminology could be attempted—for instance, is it more correct to refer to a psychosis as being one of paraphrenia or of paranoid type of schizophrenia? Again, is it more helpful to know that a patient is suffering from reactive depression or from depression of an exogenous type?

Obituary

WILLIAM P. S. BRANSON, C.B.E., M.D., F.R.C.P.

Dr. William Branson died on March 5 at his home in Bury St. Edmunds, Suffolk, at the age of 75. He was on the consultant staff of the Royal Free Hospital for many years and he was also consulting physician to St. Andrew's Hospital, Dollis Hill.

William P. S. Branson was born in India in 1874, the third son of the late J. H. A. Branson. He was educated at Bedford College, Trinity College, Cambridge, and St. Bartholomew's Hospital. He graduated M.B., B.Ch. in 1900, proceeding M.D. in 1904. His first appointment was as house-physician to Dr. Gee, who was noted for his skill and his precision in making his point in a few words, as was exemplified in his *Book of Aphorisms*. No doubt Gee exerted some influence, but Branson already had the capacity for precise and terse expression in good English. Later he worked in the pathological laboratory with Hugh Thursfield, a close friend. They re-catalogued the museum of St. Bartholomew's, and produced their book *Medical Morbid Anatomy and Pathology*, which was a considerable work. Branson became physician at St. Andrew's Hospital, Dollis Hill, and he was also appointed to the staff of the Royal Free Hospital. Later he was consulting physician to the Royal Free Hospital, and he was always popular with the students there. He was a successful teacher, though he used to say that it was partly waste of time, because, before or directly after they qualified, 50% of his students were lost to medicine through marriage. For many years Branson acted as medical attendant to the nursing staff at St. Bartholomew's Hospital. He was also physician to the Sun Life Assurance Society, and at their head office his knowledge of human nature and its foibles served him, and them, well.

Branson's consulting practice came through those who knew him best. He had a carefully considered, almost legal, precision in balancing the facts of a case, with full weight given to the human side of the problem. At the beginning of the 1914–18 war he was asked by Gordon-Watson to join the staff of the Duchess of Westminster's Hospital, which went out at once to the Casino at Le Touquet. He already knew most of the staff, and it turned out to be a congenial and happy hospital, with spells of most exacting work. In 1916 he was made consulting physician to the 5th Army B.E.F. with the rank of colonel A.M.S. He was awarded the C.B.E.

William Branson had read widely and was a good conversationalist with a fund of apt quotations and good stories. He had many hobbies. For a year or two he spent hours repairing clocks and watches, but he preferred to be out of doors, and gardening was a more satisfactory and lasting recreation. His interest was especially in fruit trees, and he had an extensive knowledge of apples, their varieties and diseases. He was an expert grafter, and loved experimenting in this field. He had fished in many places and was a good shot; until last year he had a gun in one of the largest pheasant shoots in Suffolk, but had to give up because of his failing vision. For the last few years Branson had had to "go slow," but, as no clear diagnosis of his disabilities could be made, he called them functional, until he developed a hemianopia last year. He died suddenly, as he would have wished; and with the sadness of those who knew him remains a memory of cheerful stability, wisdom, service, and above all integrity.

J. F. A.

J. A. RYLE, M.D., F.R.C.P.

Dr. Charles Brook writes: To me the most outstanding quality of John Ryle was his humility—a quality reserved for really great people. When we occasionally met he would encourage me to talk to him, and he would ask me for my views on various matters, including work which he was undertaking. We also corresponded periodically on a diversity of subjects, and he kept me acquainted with any specially interesting new activities at the Institute of Social Medicine. I learned of his last illness only when his secretary informed me that he could not acknowledge a letter I sent him, advising him of the results of a small job which I had undertaken, with his encouragement, to diminish the high incidence of affections of the upper respiratory tract on a prefabricated housing estate. It may be worth recording how Ryle first became interested in social medicine. He recounted at a wartime meeting of the Socialist Medical Association, which he never joined, that while he was regius professor of physic at Cambridge he was called into consultation to see a case of rheumatic endocarditis in a nearby village. To his dismay he noticed the damp and unhealthy conditions under which the child patient was living, and he felt there and then that it was time to take particular notice of what can best be described as environmental medicine. At the time I thought that Ryle was rather naive, because what he said was nothing new to a medical officer of health or to an observant G.P. in a working-class district, but for him this was a new experience, for hitherto his only contact with the poor had been in the hospital ward or out-patient department. But his visit to that miserable Cambridgeshire cottage had lifted the scales from his eyes and had a sequel of tremendous consequence. Henceforward he devoted his energies to social medicine, and his tremendous prestige in the profession stirred the interest and conscience not of the general public but of people of influence and wealth. It was indeed most fortunate that Lord Nuffield soon afterwards established a professorship of social medicine at Oxford. When I wrote to Ryle expressing the hope that he would be the first occupant of this chair, he modestly replied that he actually had not thought about it. I have read that by his own particular request, made shortly before he died, there will be no memorial service, but I feel very strongly that a memorial meeting should be convened in order that tributes can be paid to one of the greatest figures in the first half of twentieth-century British medicine.

Dr. RICHARD EUSTACE MAXWELL TAUNTON died on February 8 at the age of 53. He graduated M.B., Ch.B. at Edinburgh University in 1923, and after a period as a house-surgeon at the Dover Hospital he went into practice in Hanwell. He was regarded with affection by his colleagues and by the community in which he worked. He never spared himself in the service of his patients. During the recent war he was with a mobile unit, and his gallant efforts under appalling conditions resulted in the saving of many lives. He bore his long and painful illness bravely, and it was not until a few weeks before his untimely death that he could be persuaded to give up his work. Dr. Taunton was for many years a member of the B.M.A., and he was on the executive committee of the West Middlesex Division, of which he was chairman in 1936–7. His sagacity, honesty, and common sense were invaluable at all the meetings he attended. He was also a member of the West Middlesex local medical war committee from its inception. Dr. Taunton was at one time a member of the honorary medical staff of the King Edward VII Memorial Hospital, Ealing, and also of the Hanwell Cottage Hospital. During the war years, in addition to his many other duties, he was naval agent for the West Middlesex Area. There is no doubt that he will be greatly missed by his many friends and colleagues.—J. L. T.

Medical Notes in Parliament

Supplementary Estimate for N.H.S.

A Supplementary Estimate for 1949–50 presented to the House of Commons on March 6 requested the provision of a further sum of £89,400,000 for the National Health Service in England and Wales. This includes in England an additional £7,000,000 for advances to boards of governors of teaching hospitals, £35,000,000 for advances to regional hospital boards, £1,200,000 for general medical services, £12,070,000 for pharmaceutical services, £14,245,000 for general dental services, and £9,834,000 for supplementary ophthalmic services.

For Wales the additional sums required are £2,195,000 for advances to regional hospital boards, £145,000 for general medical services, £630,000 for pharmaceutical services, £599,000 for general dental services, and £471,000 for supplementary ophthalmic services.

A separate Supplementary Estimate for the National Health Service in Scotland is for £9,330,000, including an additional £4,200,000 for advances to regional hospital boards, £2,900,000 for general dental services, £1,850,000 for pharmaceutical services, and £150,000 for supplementary ophthalmic services.

These Estimates were considered in the House of Commons on March 14, and a report of the debate will appear in our next issue. An analysis of the finances of the National Health Service appears at page 664, in this issue, and further comment will be found in the leading article at page 656.

Midwives Bill

Reference was made in the King's Speech (March 11, p. 614) to the introduction of legislation relating to midwives. The Midwives (Amendment) Bill was read a first time in the House of Lords on March 8. The second reading has been set down for March 21.

The text of the Bill has now been issued and provides for the incorporation of the Central Midwives Board and the Central Midwives Board for Scotland. It also empowers the Minister of Health or the Secretary of State for Scotland to vary the constitutions of these boards. Provision is made for the certification in England and Scotland of midwives trained outside the United Kingdom. Other proposals in the Bill are that local authorities may provide accommodation for pupil midwives; that the Central Board shall lay down rules regarding the uniform to be worn by midwives; and that midwives shall be exempt from jury service.

Dental and Ophthalmic Treatment of School-children

Mr. GEORGE THOMAS spoke on March 8 about the place of school-children in the National Health Service, with particular reference to the supply of spectacles and dental treatment. The executive of the National Union of Teachers was being pressed to call for priority for school-children in the provision of spectacles. There had also been unfortunate delays in the dental treatment of children.

Mr. ANTHONY GREENWOOD said an enormous amount of arrears in the provision of spectacles had to be made up by the National Health Service. The tragedy was that these arrears were being made up at the expense of the children.

Colonel STODDART-SCOTT said that before the National Health Service there was one dentist for every 3,000 children in the schools. To-day, under an Act which instructed the Minister of Health to produce a priority dental service for schools, there was one for every 6,000 children.

Mr. BLENKINSOP said that when it became clear that manufacturers of spectacles could not keep up with the demands made on the introduction of the Health Service the Ministry held discussions with opticians and manufacturers, and it was agreed that a 5% priority scheme would be reasonable to assure speedy delivery in urgent cases. It was also agreed that the optician with full details of the case was the only person who could select priority cases. Later it was possible to increase the priority supply to 7½%. It was agreed that this figure should include school-children whose eyesight would suffer from delay.

To include all the school-children who were thought to be in need of glasses would have made it impossible to give special priority to workers in industry who could not carry on their jobs without glasses.

The priority scheme had on the whole been successful. The Government had also managed to import something like one million lenses from abroad. By January of this year the Government had been able to establish a production of lenses in the U.K. some 33% above the demand. This meant that the delays were steadily being reduced. He hoped it would be possible before long to abolish the priority scheme altogether.

Continuing, Mr. Blenkinsop said the Government faced a more serious position in the dental services because of an overall shortage of dentists. Many of these had unfortunately been attracted into private practice by the higher rate of payment. The Government was doing all it could to encourage the training of more dentists. Some local education authorities had been able to make up for the loss of full-time school dental officers by securing the part-time services of practising dentists on a sessional basis. Cardiff had been able to meet the shortage by employing part-time dentists. He hoped similar arrangements would be extended to other areas. The position varied much from one part of the country to another.

Mr. H. M. KING asked Mr. Blenkinsop to take up with Mr. Bevan the possibility of requiring dentists to undertake sessions for the school dental service as one of the conditions of their entering the General Dental Service.

Tuberculosis in Scotland

Mr. RANKIN on March 9 called attention to the problem of tuberculosis in Scotland. According to experts, if 100 trained nurses could be obtained for the treatment of cases of tuberculosis about 1,000 beds would be made available, thus breaking the back of the problem in Scotland. He asked, Could the Government give any information on the deliberations of the committee appointed in July, 1948, to inquire into the continued high incidence and mortality in Scotland? In young women aged from 15 to 25 the mortality rate from tuberculosis had reached a new high figure of 1.14 per 1,000 population; in the age group 25 to 35 the mortality rate in 1939 was 0.74, but for 1947 it was 1.74. Corresponding figures for males were not nearly so bad. Special or extra diets were available for chronic cases of tuberculosis. Why not, then, an extra diet for female adolescents in the years when the seeds of the disease were most likely to be sown?

Mr. THOMAS FRASER, replying for the Government, said the reason why the incidence of tuberculosis in Scotland was far worse than in most other West European countries since the war remained obscure. The committee appointed by the Health Services Council was on the point of reporting. Many of the questions asked by Mr. Rankin could be better dealt with when the committee's report had been received. An encouraging fact was that in 1949 the Scottish death rate from respiratory tuberculosis was 10% below the 1948 figure. He thought Mr. Rankin's figures for deaths among females in certain age groups were not very recent. The Government had not yet been able to get the 1949 figures broken down into different age groups. Although deaths went down last year notifications went up, partly because of better case-finding. The Government would continue to take cases at the earliest stage, and to this end the number of mass radiography units in Scotland was being increased. Within the next few weeks seven of these units would be in operation. With increased notifications and longer periods of hospital treatment the waiting-list tended to grow longer. In West Scotland the waiting-list was growing less, and improvement largely due to the energetic efforts of the Western Regional Hospital Board in providing additional beds. In the last 18 months the Board had diverted some 250 beds, mostly in infectious diseases hospitals.

He had consulted his officials on the statements in the Press about the British Medical Association's conference in Edinburgh. An impression had been created that, if 100 trained nurses could be got, additional beds would be made available. The doctors had not said this, but had said "together with part-time and part-trained nurses." The recruitment of nurses was improving steadily. When the revised salary scales were negotiated further consideration was given to the exceptional need to encourage nurses in tuberculosis centres, and a further financial inducement was granted. It was £30 for each completed year and an allowance to student nurses of £40 after two years in a ward for cases of respiratory tuberculosis.

The Government was encouraging more radical measures to prevent the disease. As an initial step B.C.G. vaccine was to be offered to nurses and medical students, and local authorities had been instructed to offer this protection to known contacts. At present it was necessary to obtain the vaccine from abroad, and production difficulties had caused an unfortunate hitch. Experts from this country had now returned from Denmark, where they discussed the difficulties on the spot, and the Government hoped that supplies would shortly become available again.

Cardiff.—Discussions are now taking place between the board of governors of the United Cardiff Hospitals, the University, and the City Council about a site for a new teaching hospital and medical school to replace the present inadequate premises of the Cardiff Royal Infirmary.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

The Council of the Medical School has arranged courses for general practitioners in co-operation with the consultant staff of the United Cambridge Hospitals, the purpose of which is to provide instruction in the latest methods of medicine and surgery and to make it possible for the general practitioners of the region to acquire knowledge of these methods.

The Faculty Board of Medicine expressed the opinion that those responsible for the above instruction who do not already hold University posts should receive recognition by the University in the form of appointment to Associate Lectureships in the Department of Medicine. A recommendation on these lines was approved in Congregation on March 4.

The lectureships, which are established from January 1, are as follows: Three in physic, three in surgery, two in orthopaedic surgery, two in otolaryngology, two in ophthalmology, one in thoracic surgery, two in obstetrics and gynaecology, one in paediatrics, one in dermatology, two in psychiatry, and two in radiology.

The following medical degrees were conferred in Congregation on March 4:

M.D.—J. M. Ranking, D. J. Conway, A. S. Wigfield, D. G. Wraith.

M.B., B.CHIR.—*P. M. Smythe, *D. H. Mackenzie, *F. W. Huddy.

* By proxy.

UNIVERSITY OF MANCHESTER

Alexander Colin Patton Campbell, M.B., Ch.B., F.R.C.P.Ed., has been appointed Procter Professor of Pathology and Pathological Anatomy in the University. Professor S. L. Baker will continue to hold the Chair of Pathology together with the Directorship of the Pathological Section of the Centre for Research in Chronic Rheumatism, which will then become a full-time appointment, until Dr. Campbell assumes his duties early in the summer.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

At a meeting of the Council of the College on March 9, with Sir Cecil Wakeley, President, in the chair, the award of Honorary Fellowships to Professor P. Bailliart, of Paris, and Dr. Derrick Vail, Professor of Ophthalmology, North Western University, Chicago, was announced.

Mr. R. D. Owen, F.R.C.S.Ed., of Cardiff, was elected to the Fellowship of the College *ad eundem*.

Dr. James Craigie and Dr. L. Foulds were appointed Imperial Cancer Fund lecturers in the College for 1950.

A Diploma of Membership was granted to J. W. Fullerton (Manchester).

The following hospitals were recognized under paragraph 23 of the F.R.C.S. regulations: City General Hospital, Gloucester (surgical registrar and house-surgeon); Gloucestershire Royal Hospital, Gloucester (resident surgical officer, first and second house-surgeons (decennial revision)); Elizabeth Garrett Anderson Hospital, London (one general surgical post (with no gynaecological beds), for six months only); Mildmay Mission Hospital, London (senior house-surgeon for six months only, junior registrar); St. John and St. Elizabeth, London (surgical registrar and house-surgeon).

The Services

The King of the Hellenes has conferred the decoration of Gold Cross of the Order of King George I upon Colonel (temporary) P. F. Palmer, O.B.E., R.A.M.C., in recognition of distinguished service in the cause of the Allies.

The Prince Regent of Belgium has conferred the decorations of Commandeur de l'Ordre de la Couronne upon Lieutenant-General Sir Alexander Hood, G.B.E., K.C.B., late R.A.M.C., and Commandeur de l'Ordre de Leopold II upon Brigadier J. M. Macfie, C.B.E., M.C., late R.A.M.C., in recognition of distinguished service in the cause of the Allies.

AUXILIARY R.A.M.C. FUNDS

The annual general meeting of the members of the Auxiliary Royal Army Medical Corps Funds will be held at 11, Chandos Street, London, W., on Monday, April 3, at 5 p.m., to receive the annual report and accounts for 1949 and to appoint officers and to elect auditors for 1950.

DEATHS IN THE SERVICES

FRANK C. COWTAN, C.B., C.B.E., M.R.C.S., L.R.C.P.

Air Vice-Marshal Frank Cuninghame Cowtan died at his home in Farnham, Surrey, on March 5 at the age of 61. His death followed a long illness, which unfortunately led to his retirement from the Royal Air Force on Christmas Day, 1945, and which he bore with his accustomed gallantry and stoicism. He was educated at St. Paul's School and at St. Thomas's Hospital, qualifying in 1912. After being a house-physician at the Brompton Chest Hospital, Cowtan joined the R.A.M.C. as a regular officer. He then embarked on the career he loved and for which he was so suited by temperament, discipline, and ideals. He saw active service in France during 1915 and 1916, being mentioned in dispatches. From 1917 to 1919 he served with distinction in Mesopotamia, where he was promoted brevet major and mentioned in dispatches on three occasions. In September, 1919, he transferred to the R.A.F. and was granted a permanent commission as squadron-leader and appointed commandant of the medical training depot at Halton, Bucks. Cowtan was the only regular R.A.M.C. officer to transfer to the R.A.F. on the formation of the R.A.F. Medical Branch, which initially consisted of fifty officers with permanent commissions. His transfer was at the special request of the D.M.S. Air Ministry, who wanted an officer of high character and ability to initiate the training of medical personnel and to build up the esprit de corps of a new service. In Cowtan he had found the ideal man for the job, for he was well versed in military medicine, punctilious, keen, smart, tactful, and with the gift of inspiring confidence.

Cowtan's career in the R.A.F. was distinguished. He always filled an important post and always with success. He was Deputy P.M.O. in Iraq from 1926 to 1928, after which he was employed on senior staff duties at the Air Ministry from 1929 to 1934. He was in command of Princess Mary's R.A.F. Hospital at Halton, and was later P.M.O. Middle East Command, whence he was invalided home with a severe attack of undulant fever. He took an active interest in B.M.A. work, being president of the Mesopotamia Branch in 1928–9 and of the Egyptian Branch in 1937–8.

At the beginning of the 1939–45 war Cowtan was P.M.O. Coastal Command, and was mentioned in dispatches in January, 1941. He was appointed Honorary Surgeon to the King in March, 1941, an appointment he held until his retirement. He became P.M.O. of Fighter Command in 1943, and was awarded the C.B. for his services there. He was appointed P.M.O. to the Supreme Headquarters of the Allied European Forces (SHAEF) in 1944 in connexion with the planning of the medical arrangements for the invasion of Normandy, and was awarded the C.B.E. in January, 1946.

Cowtan was one of the ablest administrators of the R.A.F. Medical Branch. He possessed great charm of manner, was always courteous and calm, and most reliable in everything he did. He subdued his emotions and always presented a serene exterior, which may have contributed to the later development of the hypertension and coronary disease from which he died. He was a good artist, a first-class shot, fond of fishing, golf, and ornithology. He had a flair for crossword puzzles, and usually finished that of *The Times* in the train from Wendover to Marylebone. He loved good literature, but it had to be good, for he abhorred anything trashy in life. Those things or actions which he did not like he tactfully avoided. His death will be keenly felt by his many colleagues and friends, who will extend their deep sympathy to his widow, daughter, and son.—H. E. W.

No. 8

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended February 25.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The principal towns in Northern Ireland.

A dash — denotes no case; a blank space denotes disease not notifiable or no return available.

Disease	1950 (a)	(b)	(c)	(d)	(e)	1949 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Meningococcal infection	31	1	10	2	1	37	3	24	3	2
Deaths		2	1				—	—		
Diphtheria	74	9	12	3	4	112	10	30	9	4
Deaths	1	—	—	—	—	3	—	—	—	—
Dysentery	445	21	119	2	3	104	29	33	1	1
Deaths					—					—
Encephalitis, acute	4	—	1	—	—	—	—	—	—	—
Deaths		—					—			
Erysipelas			33	10	1			37	9	7
Deaths										
Infective enteritis or diarrhoea under 2 years				11					38	
Deaths	26		4	3	1	41		8	1	3
Measles*	4,980	45	124	108	413	19,502	777	134	151	149
Deaths†			—	—	—			1	—	—
Ophthalmia neonatorum	55	3	10	—	1	45	3	12	—	—
Deaths										
Paratyphoid fever	6	1	2 (B)	—	—	9	1	6 (B)	—	—
Deaths	—		—		—	—	—	—	—	—
Pneumonia, influenzal	1,098	64	36	—	18	1,469	119	62	18	22
Deaths (from influenza)‡	78	8	14	1	5	158	33	21	—	—
Pneumonia, primary			345	¶				358	49	
Deaths	304	61		13	18	422	104		9	20
Poliomyelitis, acute	38	7	—	7	—	20	1	1	1	—
Deaths§	3	1		—		1	—			
Puerperal fever		—	10				—	4		
Deaths										
Puerperal pyrexia‖	86	9	6	1	—	121	12	8	—	2
Deaths							—			
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	2,064	114	197	77	131	1,333	77	204	115	43
Deaths†			—	—	—			—	—	—
Smallpox	—	—	—	—	—	—	—	—	—	—
Deaths					—					—
Typhoid fever	10	3	—	1	—	3	—	—	3	—
Deaths	—	—	—		—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths					—					—
Whooping-cough*	1,679	78	374	48	39	3,027	191	259	63	67
Deaths	5	—	—	—	—	16	—	1	3	—
Deaths (0–1 year)	283	33	39	29	11	387	46	57	22	21
Deaths (excluding stillbirths)	5,882	935	778	226	175	6,992	1324	771	220	161
Annual death rate (per 1,000 persons living)			15·6					15·5	13·6	
Live births	7,545	1235	965	434	236	8,069	1299	901	424	222
Annual rate per 1,000 persons living			19·4					18·1	26·3	
Stillbirths	178	19	21			202	28	21		
Rate per 1,000 total births (including stillborn)			21					23		

* Measles and whooping-cough are not notifiable in Scotland, and the returns are therefore an approximation only.

† Deaths from measles and scarlet fever for England and Wales, London (administrative county), will no longer be published.

‡ Includes primary form for England and Wales, London (administrative county), and Northern Ireland.

§ The number of deaths from poliomyelitis and polio-encephalitis for England and Wales, London (administrative county), are combined.

‖ Includes puerperal fever for England and Wales and Eire.

¶ Primary pneumonia no longer notifiable in Eire.

EPIDEMIOLOGICAL NOTES

Influenza and Pneumonia

Local outbreaks of influenza of a mild type due to virus B continue to occur and are widely distributed. According to the Ministry of Health, however, there is no sign of an epidemic. Virus B has been isolated from a few odd cases in widely scattered areas, for example, Doncaster, London, Exeter, Inverness, Ipswich, and elsewhere.

Some relevant figures for the first eight weeks of this year are tabulated below:

(a) Pneumonia cases and deaths and influenza deaths in the Great Towns.

Week Ending	Jan. 7	Jan. 14	Jan. 21	Jan. 28	Feb. 4	Feb. 11	Feb. 18	Feb. 25
Pneumonia:								
Cases*	639	550	487	494	594	582	630	595
Deaths ..	299	300	233	305	354	378	353	304
Influenza:								
Deaths*	52	47	39	47	61	80	76	78

* Including influenzal pneumonia.

(b) Totals from first week of the year in Great Towns.

	1948	1949	1950
Pneumonia:			
Cases	3,748	5,131	4,575
Deaths	2,210	2,982	2,526
Influenza:			
Deaths	165	737	480

The following cities had the largest numbers of notifications of pneumonia for the week ending February 25: London 131, Sheffield 58, Birmingham 54, Manchester 52, Liverpool 42, Sunderland 28.

There are reports of a high incidence of upper respiratory disease in some practices and it seems probable that much of this may be due to haemolytic streptococci.

Discussion of Table

In *England and Wales* there were increases in the notifications of measles 454 and dysentery 101, while decreases were recorded for acute pneumonia 91 and scarlet fever 66.

Notifications of dysentery were the largest for almost five years and included: Yorkshire West Riding 205 (Sheffield C.B. 122, Leeds C.B. 59, Bradford C.B. 16); Durham 45 (Blaydon U.D. 19, Sunderland C.B. 9, South Shields C.B. 7); Carmarthen 31 (Carmarthen M.B. 31); Gloucestershire 31 (Bristol C.B. 31); Glamorganshire 28 (Cardiff C.B. 28); Lancashire 27 (Liverpool C.B. 7, Manchester C.B. 7); Northumberland 25 (Newcastle-upon-Tyne C.B. 12, Gosforth U.D. 12); and London 21 (Islington 8).

The largest outbreak of food-poisoning notified was in Devonshire, Plymouth C.B. 24.

In *Scotland* there were increases in the notifications of measles 47 and dysentery 22, while decreases were recorded for scarlet fever 36, whooping-cough 27, and acute primary pneumonia 18. The chief centres of dysentery were Glasgow 28, Dundee 27, Perth 25, Edinburgh 15, and Lanark county 12. The decrease in the incidence of scarlet fever was mainly due to the experience of the south-eastern area.

In *Eire* infectious diseases were less prevalent during the week, and there were decreases in the incidence of whooping-cough 55, measles 29, and scarlet fever 12. Outbreaks of measles were reported from Donegal, Stranorlar R.D. 30, and Tipperary, Suir No. 1 R.D. 15.

In *Northern Ireland* there was an increase in the notifications of measles 66, while decreases were recorded for scarlet fever 17 and whooping-cough 13. The rise in the incidence of measles was fairly general throughout the country. In Belfast C.B. the notifications of scarlet feyer fell by 32.

Week Ending March 4

Notifications of infectious diseases in England and Wales during the week included: scarlet fever 1,758, whooping-cough 1,614, diphtheria 70, measles 4,684, acute pneumonia 1,000, acute poliomyelitis 28, dysentery 280, paratyphoid fever 7, typhoid fever 14. In the great towns deaths from influenza numbered 76.

Medical News

Assistant Editor of B.M.J.

Though many members of the medical profession make journalism or some other kind of writing their hobby, few ever think of it as a career. This is partly because there are so few openings, but one is advertised in the *Journal* this week at p. 24 of the advertisement pages. An assistant editor is needed for the *B.M.J.* The job is full-time and the salary scale £1,500 to £2,200 a year. A knowledge of medicine is as necessary as the ability to write clearly, but young men should not be deterred from applying because they have not spent many years in the practice of their profession. Applications should be sent to the Editor before April 15 with the particulars set out in the advertisement.

WHO on Nursing Shortage

A World Health Organization committee has recently discussed the world-wide shortage of nurses. It recommended that national and international studies should be made of the factors preventing recruitment. Among these are the competition of more attractive professions and the lack in some places of sufficient types of training programme. It proposed also that a joint WHO–ILO pilot study be undertaken on the working conditions of nurses. As additional measures for increasing the supply of nurses the committee suggested that Governments should consider such sources of candidates as minority groups and immigrants. It was mentioned that in England and Wales there are 5,000 beds available for the treatment of tuberculosis which remain empty owing to the lack of trained nurses. In India only 100 to 200 nurses are employed on tuberculosis work, though the actual needs of the country in this branch are estimated at 10,000 nurses. The chairman of the committee was Miss Mary I. Lambie, of New Zealand.

WHO Visit to South Pacific

Dr. G. Brock Chisholm, Director-General of the World Health Organization, has gone on a five-week visit to the U.S.A., New Zealand, and Australia. In New York he gave an address on March 13 at the premier showing at Hunter College of the first UN–WHO-sponsored film on cancer. In San Francisco he will participate with Mr. Dean Acheson in the University of California Conference on International Co-operation for Economic Development. In Australia and New Zealand he will confer with health authorities on specific ways in which WHO can be of assistance in the South Pacific area.

French Honour for British Doctors

On March 9 the President of France, M. Vincent Auriol, and Mme. Auriol paid a visit to the French Hospital in Shaftesbury Avenue, London. After M. Auriol had visited the men's section and Mme. Auriol had toured the women's wards the President held an informal investiture in the hospital committee-room, where he decorated Dr. James Moore, Mr. H. W. S. Wright, and Dr. Andrew J. Morland each as a Chevalier of the Legion of Honour.

Industrial Dermatitis

A new medical film which received its first showing last week was introduced by Dr. Henry MacCormac. An appreciative audience, which included the Rt. Hon. G. A. Isaacs, Minister of Labour and National Service, saw an effective presentation of some of the main problems of industrial dermatitis. The film emphasizes the importance of an understanding of the anatomy and physiology of the skin and goes on to show, for example, oil acne, tar warts, ringworm, yeast, and monilia infections, and some interesting examples of celery dermatitis and other forms of contact and chemical dermatitis. Throughout the emphasis is on careful investigation at the place of work in order to determine which of many agents may be responsible for a particular case of industrial dermatitis. Mr. Isaacs congratulated I.C.I. Ltd. on this new film, which was made with the co-operation of St. John's Hospital for Diseases of the Skin and the Middlesex Hospital.

Glasgow Royal Infirmary Club

The Glasgow Royal Infirmary Club held its first annual dinner since 1939 in the North British Station Hotel, Glasgow, on March 9. Sir Alexander Macgregor was in the chair, and the guests of the club were Dr. O. H. Mavor, Lord Boyd-Orr, and Mr. W. A. Sewell. The secretary is anxious to get in touch with all former residents of the Glasgow Royal Infirmary, and any who did not receive notice of this year's dinner are asked to send their names and addresses to Mr. William S. Mack, 20, Royal Terrace, Glasgow, C.3.

Medical Society of London Dinner

The 170th anniversary dinner of the Medical Society of London was held at Claridge's Hotel on March 9, with the president, Mr. Lionel E. C. Norbury, in the chair. After the loyal toasts had been honoured, Mr. Laurence H. F. Irving proposed the health of the Society, whom he reminded of the warning given to his grandfather, Henry Irving, when he first arrived in New York. Henry Irving was being entertained by the Lotus Club, and the chairman warned him that however genial the banquet might appear American hosts were apt to treat their foreign guests much as they did their national bird the turkey, which they first fed and then carved up. Mr. Laurence Irving said he owed much to two things, an intimate friendship with several doctors and a cabinet stuffed with patent medicines. He understood that many men and women visited doctors in order to have an excuse to talk about themselves, a temptation he now found quite irresistible. Just before he was born his mother took London by storm with her performance as Trilby, but shortly after his birth she left the stage and became a pioneer in infant welfare. After an amusing account of how he tried to keep his feet dry in two world wars Mr. Irving sought to discover how much artists and doctors had in common. Both were lifelong students of nature and human behaviour. The life of the artist was devoted to expression of himself, and the life of a doctor was one of self-denial in which time, home, and family life were subject to the demands of his fellow men. Artists were notoriously idle and gregarious. But doctors were always on duty; they were like lifeboat men, at the immediate call of shipwrecked humanity. In response the president, Mr. Norbury, gave some account of the activities of the Medical Society of London during the past year, and paid due tribute to the excellent support he had had from the honorary secretaries and the registrar. In a graceful and entertaining speech Mr. Cuthbert Dukes proposed the health of the visitors, and Sir Cecil Wakeley, President of the Royal College of Surgeons, suitably replied.

Tuberculosis Prize

The N.A.P.T. is offering a 100-guinea prize for the best essay embodying the author's ideas and proposals for the improvement of the control of tuberculosis throughout Britain. The competition is open to doctors of ten years' standing who are working as tuberculosis officers, chest physicians, or sanatorium medical superintendents in the United Kingdom. Opinions should be based on personal experiences, and special regard will be paid to the originality of the views expressed. The competition is open until March 1, 1951, and further details can be obtained from the secretary-general, N.A.P.T., Tavistock House North, Tavistock Square, London, W.C.1.

New Journal of Sociology

The first number of the *British Journal of Sociology* has appeared dated March, 1950. It will be published quarterly under the editorship of Professor Morris Ginsberg, Martin White Professor of Sociology in London University, Professor D. V. Glass, Professor of Sociology in London University, and Professor T. H. Marshall, Professor of Social Institutions in London University. The journal will publish original articles on sociology, social psychology, and social philosophy. The annual subscription is 30s., and particulars may be obtained from the editor of the journal at the London School of Economics, Houghton Street, Aldwych, London, W.C.2.

Medical Golf

At the annual general meeting of the Medical Golfing Society Mr. John Everidge was elected president and Dr. S. Pope captain. At the annual general meeting of the London Irish Medical Golfing Society Mr. W. McK. H. McCullagh was elected president and Dr. D. S. Magner captain.

COMING EVENTS

British Medical Students Association

The following lecture has been arranged. *London Hospital Medical College.*—March 21 (5.30 p.m.): "Geriatrics," by Dr. Marjory Warren.

Institute of Almoners

The annual general meeting of the Institute of Almoners will be held at the Town Hall, Leamington Spa, on Saturday, March 25, at 2.30 p.m., when Professor Thomas McKeown, professor of social medicine in the University of Birmingham, will deliver an address.

International Haemophilia Society

The annual general meeting will be held on Sunday, March 26, at the Society for Visiting Scientists, 5, Old Burlington Street, Piccadilly, London, W.1, at 2.30–5 p.m. Members and visitors will be welcome for the purpose of establishing contact and the interchange of information. Anyone wishing to attend should write first to the honorary secretary at the Galton Laboratory, University College, Gower Street, London, W.C.1, enclosing a stamped, addressed envelope.

The Renal Association

The first meeting of this association will be held on Thursday, March 30, at 4.30 p.m. (tea at 4 p.m.) at the Ciba Foundation, 41, Portland Place, W.1. Officers will be elected, and a paper will be read by Mr. D. F. Ellison Nash on "Form and Function in the Renal Tract—Review and Prospect."

Scientific Films

The Scientific and Technical Group of the Royal Photographic Society and the Sciences Committee of the Scientific Film Association will hold a discussion meeting on "Photography and Cinematography by Invisible Radiation" at the London University Institute of Education on Saturday, April 15. Subjects to be discussed include ultra-violet microscopy, infra-red technique, and *x*-ray photography and cinematography. Particulars may be obtained from the Scientific Film Association, 4, Great Russell Street, London, W.C.1.

Chesterfield Medal Examination

The Chesterfield Medal examination in dermatology will be held at the Institute of Dermatology, St. John's Hospital for Diseases of the Skin, Lisle Street, London, W.C., on Monday, Tuesday, and Friday, April 17, 18, and 21. Full particulars may be obtained on application to the secretary of the institute.

Empire Rheumatism Council

A week-end postgraduate course, arranged by the Empire Rheumatism Council, will be held at the Hall of the Society of Apothecaries of London, Black Friars Lane, Queen Victoria Street, E.C., on Friday, Saturday, and Sunday, April 28, 29, and 30. The programme is as follows: April 28, 4.30 p.m., Sir Adolphe Abrahams, "The Differential Diagnosis of Rheumatism"; 5.30 p.m., Dr. George Graham, "Gout." April 29, 10 a.m., Dr. J. J. R. Duthie, "Fundamentals in the Treatment of Arthritis"; 11.15 a.m., Dr. P. M. F. Bishop, "Applied Physiology of the Adrenals"; 2 p.m., Dr. D. H. Collins, "The Pathology of the Rheumatic Diseases"; 3 p.m., Dr. F. Dudley Hart, "Rarer Arthropathies and Allied States"; 4.30 p.m., Dr. Oswald Savage, "Rheumatoid Arthritis." April 30, 10 a.m., Dr. F. S. Cooksey, "Physical Methods in the Rheumatic Diseases"; 11.15 a.m., Mr. J. C. R. Hindenach, "Orthopaedic Aspects of the Rheumatic Diseases." The fee for the course (limited to 100) is £2 2s., and remittances must reach the general secretary of the council, Tavistock House (North), Tavistock Square, London, W.C.1, at least one week before the course begins.

Royal Sanitary Institute

A Health Congress will be held by the Royal Sanitary Institute at Eastbourne on April 24–28 under the presidency of Earl de la Warr. The following sections will be held on medical subjects (presidents of sections are shown in parentheses): Preventive Medicine (Professor James Mackintosh); Maternal and Child Health (Professor Hilda Lloyd); Food and Nutrition (Mr. A. L. Bacharach); Tropical Hygiene (president not appointed); Hygiene in Industry (Dr. Donald Stewart); Medical Officers of Health (Dr. H. C. Maurice Williams); and Health Visitors (Professor A. A. Moncrieff). Full particulars may be obtained from Royal Sanitary Institute, 90, Buckingham Palace Road, London, S.W.1.

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Wessex Rahere Club

The spring dinner of the Wessex Rahere Club, which is open to all Bart's men resident in the South-west of England, will be held at the County Hotel, Taunton, on Saturday, April 29, when Mr. J. B. Hume will be the guest of honour. Full particulars may be obtained from the honorary secretary of the club, Mr. A. Daunt Bateman, 3, The Circus, Bath.

SOCIETIES AND LECTURES

Monday

HUNTERIAN SOCIETY.—At Talbot Restaurant, 64, London Wall, E.C., March 20, 7 for 7.30 p.m., dinner-meeting; "*Modern Trends in the Diagnosis and Treatment of Pulmonary Tuberculosis*," discussion to be opened by Dr. Geoffrey Marshall and Mr. T. Holmes Sellors.

INSTITUTE OF OPHTHALMOLOGY (UNIVERSITY OF LONDON), Judd Street, London, W.C.—March 20, 5.30 p.m., "*Physiology of the Autonomic Nervous System in Relation to the Eye*," by Dr. D. Slome.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—March 20, 5.30 p.m., "*The Varieties and Modes of Renal Failure*," Urology Lecture by Professor C. A. Wells.

Tuesday

EUGENICS SOCIETY.—At Royal Society, Burlington House, Piccadilly, London, W., March 21, 5.30 p.m., "*The Quality of the Rural Population*," by Mrs. Barbara Bosanquet, B.A.

INSTITUTE OF DERMATOLOGY, Lisle Street, Leicester Square, London, W.C.—March 21, 5 p.m., "*Cutaneous Tuberculosis*," by Dr. G. B. Dowling.

INSTITUTE OF OPHTHALMOLOGY (UNIVERSITY OF LONDON), Judd Street, London, W.C.—March 21, 5.30 p.m., "*Pituitary Tumours*," by Mr. G. C. Knight.

INSTITUTE OF UROLOGY.—At St. Paul's Hospital, Endell Street, London, W.C., March 21, 5 p.m., "*Retropubic Operations on the Prostate*," by Mr. A. W. Badenoch.

ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS, 58, Queen Anne Street, London, W.—March 21, 5 p.m., "*Hydatidiform Mole and Chorioepithelioma*," John Shields Fairbairn Memorial Lecture by Professor Arthur T. Hertig (Boston, U.S.A.).

Wednesday

GLASGOW UNIVERSITY: DEPARTMENT OF OPHTHALMOLOGY.—March 22, 8 p.m., "*Primary Visual Receptors*," by Dr. T. D. M. Roberts.

HARVEIAN SOCIETY OF LONDON.—At 26, Portland Place, London, W., March 22, 8.45 p.m., "*Harvey and the Scientific Method*," Harveian Lecture by Sir Henry Cohen.

INSTITUTE OF OPHTHALMOLOGY (UNIVERSITY OF LONDON), Judd Street, London, W.C.—March 22, 5.30 p.m., "*Compression of the Optic Nerves and Chiasm by Parasellar Lesions*," by Mr. G. C. Knight.

INSTITUTE OF SOCIAL PSYCHIATRY.—At Seymour Hall, Seymour Place, London, W., March 22, 2 p.m., "*Day Hospitals and Social Rehabilitation*." Conference and discussion. Speakers will include Dr. Noel Harris, Dr. Joshua Bierer, Dr. E. B. Strauss, Dr. Donald Blair, Dr. Doris Odlum, and Dr. Desmond O'Neill.

INSTITUTE OF UROLOGY.—(1) At St. Peter's Hospital, Henrietta Street, London, W.C., March 22, 3.30 p.m., *X* Rays and Museum Specimens, by Mr. H. Rees: (2) At St. Paul's Hospital, Endell Street, London, W.C., March 22, 5 p.m., "*Endoscopic Operations on the Prostate*," by Mr. R. Ogier Ward.

ROYAL INSTITUTE OF PHILOSOPHY.—At University College (Anatomy Theatre), Gower Street, London, W.C., March 22, 7.30 p.m., "*The Gates of the Future*," by Professor J. W. Harvey.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE, 28, Portland Place, London, W.—March 22, 3.30 p.m., "*The Social Value of Modern Physical Education*," by Lieutenant-Colonel J. Edmundson.

ROYAL SOCIETY OF ARTS, John Adam Street, Adelphi, London, W.C.—March 22, 2.30 p.m., "*Chemistry as an Instrument of Culture*," Pope Memorial Lecture by Professor John Read, F.R.S.

SOCIETY OF CHEMICAL INDUSTRY: FOOD GROUP.—At Burlington House, Piccadilly, London, W., March 22, 6.15 p.m., meeting of Nutrition Panel. "*Jams and Some Other Spreads as Food*." papers by Messrs. L. E. Campbell, Ph.D., W. Birch, R. De Giacomi, and E. R. Bransby, Ph.D.

Thursday

INSTITUTE OF UROLOGY.—At St. Paul's Hospital, Endell Street, London, W.C., March 23, 5 p.m., "*Stricture of the Urethra*," by Mr. J. E. Semple.

MEDICO-LEGAL SOCIETY.—At 26, Portland Place, London, W., March 23, 8.15 p.m., "*Alcohol and the Motorist*," by Dr. J. A. Gorsky.

ST. GEORGE'S HOSPITAL MEDICAL SCHOOL, Hyde Park Corner, London, S.W.—March 23, 4.30 p.m., "*Psychiatry*," lecture-demonstration by Sir Paul Mallinson.

TORQUAY AND DISTRICT MEDICAL SOCIETY.—At Torbay Hospital, March 23, 8.30 p.m., "*Diseases of the Rectum and Anus and Their Treatment*," by Mr. R. Marnham.

Friday

BIOCHEMICAL SOCIETY.—At Department of Biochemistry, University College, Gower Street, London, W.C., March 24, 11.30 a.m., annual general meeting. Papers will be read.

MAIDA VALE HOSPITAL FOR NERVOUS DISEASES, Maida Vale, London, W.—At Medical School, March 24, 5 p.m., Neurological Demonstration by Dr. S. Nevin.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, London, W.C.—March 24, 5 p.m., "*Syphilis in the Oral Cavity*," Urology Lecture by Dr. V. E. Lloyd.

ROYAL SANITARY INSTITUTE.—At University Reception Room, Main University Building, Queens Road, Bristol, March 24, 10 a.m., sessional meeting. Symposium: "*Typhoid Fever—A Recent Outbreak*." Papers by Dr. J. Hutton, Mr. R. Williams, D.P.A., Drs. K. Cooper and J. Macrae.

Saturday

ST. STEPHEN'S HOSPITAL (RHEUMATISM UNIT), 369, Fulham Road, London, S.W.—March 25, 10 a.m., "*The Significance of the Effect of Compound E in Rheumatoid Arthritis*," introductory address by Professor G. W. Pickering; 11 a.m., "*Rheumatoid Disease: Its Widespread Clinical Manifestations*," by Dr. Philip Ellman; 12 noon, "*Modern Conception and Management of Rheumatic Fever*," by Dr. E. G. L. Bywaters; 2 p.m., "*Organization of a Rheumatic Unit with Special Reference to the Management of Rheumatoid Arthritis*," by Dr. Francis Bach; 3 p.m., Ward Round and demonstration of methods of physical treatment, injection, and plaster technique. Rehabilitation, by Dr. Francis Bach and the Medical Registrars; 4.15 p.m., "*Clinical Pathology in Gout and the Rheumatic Diseases*," by Dr. A. G. Signy; 5.15 p.m., "*The Radiological Diagnosis of the Rheumatic Diseases*," Lantern lecture by Dr. Grace Batten.

Sunday

ST. STEPHEN'S HOSPITAL (RHEUMATISM UNIT), 369, Fulham Road, London, S.W.—March 26, 10 a.m., Ward Round with demonstration of cases, by Dr. Philip Ellman and the Medical Registrars; 11.15 a.m., "*Joint Lesions in General Medicine*," by Dr. Philip Ellman; 12 noon, "*The Painful Shoulder*," by Mr. H. E. Harding; 2 p.m., "*Orthopaedic Aspects of Rheumatic Disease and the Prevention and Treatment of Deformities*," by Mr. Timbrell Fisher; 2.45 p.m., Demonstration of cases and treatment by manipulation (if cases are available), by Mr. Timbrell Fisher; 3.30 p.m., "*Pain—Neurotic and Referred*," by Dr. Colin Edwards; 4.30 p.m., "*Psychiatric Factors in the Chronic Rheumatic Diseases*," by Dr. David Shaw.

APPOINTMENTS

BONE, ALAN W., F.R.C.S., Senior Consultant Surgeon to Stockton and Thornaby Hospital and to Sedgefield General Hospital, Newcastle-upon-Tyne Regional Hospital Board.

EAST ANGLIAN REGIONAL HOSPITAL BOARD.—*Senior Registrar in Gynaecology and Obstetrics in Peterborough Area*, A. B. Backus, M.B., B.S., M.R.C.O.G.; *Assistant Senior Medical Officer to the Board*, P. J. H. Clarke, M.B., B.Ch., D.P.H., T.D.D.

BIRTHS, MARRIAGES, AND DEATHS

BIRTHS

Ashcroft.—On March 4, 1950, at Newcastle-upon-Tyne, to Alison (née Gillespie), wife of Dr. Anthony Ashcroft, a daughter.

Doyle.—On February 21, 1950, at the Liverpool Maternity Hospital, to Margaret, wife of Mr. Richard Doyle, F.R.C.S., a daughter.

Marrow.—On March 1, 1950, at the Women's Hospital, Nottingham, to Mr. and Mrs. A. H. Marrow, a daughter—Elizabeth Sarah.

Suchett-Kaye.—On February 27, 1950, in London, to Beryl Daphne (née White), M.R.C.S., L.R.C.P., wife of A. I. Suchett-Kaye, M.D., M.R.C.P., a brother for Charles—Robert.

Thompson.—On February 27, 1950, at Southsea, to the wife of Dr. T. J. Thompson a daughter.

Weetch.—On March 7, 1950, at Sheffield, to Iola, wife of Robert Scott Weetch, M.B., M.R.C.P., a daughter.

DEATHS

Bailey.—On March 5, 1950, at the Purey Cust Nursing Home, Yorks, Henry Bailey, M.R.C.S., L.R.C.P., formerly of The Croft, Horsforth, Leeds, Yorks.

Bisset.—On March 8, 1950, at Brookside, Nelson, New Zealand, Ernest Bisset, M.B., Ch.B., D.P.H., Lieutenant-Colonel, I.M.S., retired.

Branson.—On March 5, 1950, at Bradfield Hall, Bury St. Edmunds, Suffolk, William Philip Sutcliffe Branson, C.B.E., M.D., F.R.C.P., aged 75.

Cowtan.—On March 5, 1950, at his home, Sandford, Shortheath, Farnham, Surrey, Frank Cuninghame Cowtan, C.B., C.B.E., M.R.C.S., L.R.C.P., Air Vice-Marshal, retired.

Any Questions?

Correspondents should give their names and addresses (not for publication) and include all relevant details in their questions, which should be typed. We publish here a selection of those questions and answers which seem to be of general interest.

Treatment of Cerebral Haemorrhage

Q.—*What is the management of a case of hypertensive cerebral haemorrhage after the haemorrhage has stopped, leaving aphasia and right-sided paralysis? How long should the case remain in bed, and when should rehabilitation start?*

A.—It is usual to keep a patient in bed for about three weeks after a cerebral haemorrhage. Not only does this minimize the risk of a recurrence, but a patient who has developed hemiplegia is not likely to be strong enough to sit up out of bed in a shorter time. Passive movements of the paralysed limbs at all joints should be begun, however, at the end of the first week and carried out, if possible, twice a day to prevent the development of contractures, the foot being supported in the intervals by means of a sandbag or a night shoe, while a splint is used to prevent wrist drop. Exercises should be started as soon as power begins to return to the limbs. Slings and springs are a help if they are available. Re-education in speech is a task for a trained speech therapist, and its nature will depend upon the type of aphasia present. A month after the onset of the illness is usually early enough to begin this. It will require much patience and perseverance, and no lesson should last long enough to cause fatigue.

Axillary Inlet Syndrome

Q.—*I have encountered a series of cases which seem to have no definite description in the literature, and, what is worse, do not seem to respond to any therapy that I may devise. These patients are mostly women in the late forties. The majority are nervous, apprehensive individuals who complain of numbness and tingling, with pains in the forearm and hand. They are woken up at night by these symptoms, and thereafter cannot get back to sleep; they are rarely if ever troubled in the daytime. Occasionally the pains may ascend as far as the shoulder region. Clinically there seems very little to find. There is no change in reflexes or sensation in the affected limbs. I cannot demonstrate any circulatory disorder and there is no evidence of trophic changes. X-ray examination in a number of cases has shown no bony abnormality of the cervical spine or upper ribs. What is the cause, and what is the treatment?*

A.—The clinical picture so accurately described in this question is often termed the "axillary inlet syndrome." It is believed to be caused by dropping of the shoulder girdle, with consequent compression of the brachial plexus as it passes over a normal first (thoracic) rib. It is not unusual for the shoulder girdle to drop in middle and later life, and the tendency is increased by heavy work and atonic musculature.

The symptoms are rapidly relieved by rest in bed with the arms supported by slings; however, this is necessary only in severe cases. Most patients recover in a short while when heavy lifting and carrying are forbidden and exercises designed to improve the tone of the muscles supporting the shoulder girdle are prescribed.

Bismuth and Neoarsphenamine

Q.—*What is the best bismuth preparation for use in conjunction with neoarsphenamine? Patients find bismuth oxychloride quite painful, and the same applies to bismuth metal. Is there any danger if a bismuth preparation is injected into a vein accidentally?*

A.—Choice of the bismuth preparation to be used in conjunction with neoarsphenamine must depend on whether a slow or rapid action is desired. In general, an aqueous suspension of bismuth metal or one of its salts—for example, the oxychloride—or an oily suspension—say, the salicylate—is indicated; oil-soluble bismuth is used when a comparatively rapid effect is desired. The pain caused by an injection of any one of these preparations is more often than not due to faulty technique. If a sharp needle is inserted into the upper and outer quadrant of the buttock and the injection given slowly and without undue pressure, little pain should result, especially if the site is well massaged afterwards. Should resistance to pressure on the piston of the syringe be met with, the needle should be partially withdrawn and reinserted in a different direction. Commonly pain is due to the bismuth preparation being deposited in dense tissue where it exerts pressure. There is considerable danger of embolism if bismuth is injected into a vein. To avoid this the needle should be inserted first, the syringe being attached to it afterwards, and suction exerted on the piston before giving the injection.

Streptomycin in Infantile Gastro-enteritis

Q.—*Has any work been done on the absorption of streptomycin from the gastro-intestinal tract in small infants? Is streptomycin of value in the treatment of infantile gastro-enteritis?*

A.—Streptomycin is, for practical purposes, unabsorbed from the gut. It is not demonstrable in the blood after relatively huge doses by mouth, although the appearance of some substance inhibitory to *B. subtilis* in the urine after its administration suggests that streptomycin may be absorbed in amounts not revealed by the ordinary *in vitro* techniques (Kornegay, G. B., Forgacs, J., and Henley, T. F., *J. Lab. clin. Med.*, 1946, **31**, 523). Because of this lack of absorption and in view of its action on Gram-negative bacteria the exhibition of streptomycin in infantile gastro-enteritis is reasonable, and in a small series of cases James and Kramer (*Lancet*, 1948, **2**, 555) claim to have obtained significantly better results with streptomycin than in a control group. Little confirmatory evidence for their work has been forthcoming, however, and while an occasional case may respond dramatically to streptomycin the aetiology of infantile gastro-enteritis is probably so varied that no single form of drug treatment is likely to be successful in more than a small proportion of the cases encountered.

Adrenaline Cream

Q.—*What is the value, if any, of the treatment of rheumatism, arthritis, fibrositis, etc., by massage with adrenaline cream?*

A.—The value of massage with adrenaline cream in the treatment of various types of rheumatic disease is merely equal to the value of the massage itself in these conditions. Adrenaline applied externally in this fashion cannot be shown to have any therapeutic effect, although the lanolin cream which constitutes the base is quite a good skin lubricant for massage. It may be for this reason that certain physiotherapists find such preparations useful. The rationale of this treatment has been said to be based upon the recent demonstration of the effect of adrenal cortical extracts upon the progress of rheumatoid arthritis and possibly other rheumatic diseases. It must be pointed out, however, that adrenaline is the secretion of the medulla, and not of the cortex of this gland.

Syphilitic Aortitis

Q.—*How effective is potassium iodide in the treatment of syphilitic aortitis or syphilitic aneurysm of the aorta? What is the accepted modern method of treatment in an early and in a late case of syphilitic aortitis?*

A.—Potassium iodide probably has little curative effect on syphilitic aortitis and none on aneurysm, though many still employ it in all forms of late syphilis. The first principles of treatment in cases of aortitis, both early and late, are rest, restriction of physical activity, and maintenance or attainment of compensation. Penicillin is undoubtedly the remedy of choice, and the danger of a Herxheimer reaction is probably small if suitable supportive treatment is given first. The dosage should be not less than 8–10 mega units spread over at least fifteen days. This should be followed by courses of bismuth extending over at least two years; the longer the aortitis has

been present the longer the period of treatment. Arsenic and mercury have largely fallen into disuse for the treatment of this condition. If a Herxheimer reaction is feared, small doses of bismuth may be given over a period of eight to ten weeks before penicillin is employed.

Extramembranous Pregnancy

Q.—*After the loss of a considerable amount of liquor followed by a little dark red blood and clots in a three to four months' pregnancy, is it possible for the foetus to live? On examination the uterus and cervix appear to be normal.*

A.—If the fluid is definitely liquor amnii abortion will almost certainly take place, but this is not inevitable. The opening in the membranes permitting the escape of liquor might become sealed. Even failing that there are cases on record in which pregnancy has gone to term with the membranes open and retracted from around the foetus and discharging liquor continuously—a condition of extramembranous pregnancy.

Malignant Melanoma

Q.—*Is a malignant melanoma likely to give any trouble after only a local excision? The case I have in mind is a woman of 30 with a naevus on her calf which was injured about seven years ago. Shortly afterwards it became darkly pigmented and discharged intermittently. After a local excision eighteen months ago the pathologist reported that the tumour was a malignant melanoma. A dissection of the inguinal lymph glands, which have never been palpable, was not performed. The patient is to-day in good health, without any sign of secondary deposits. Should a block dissection of the inguinal glands be performed, or would this be of little use at this stage?*

A.—A malignant melanoma involving the skin of the leg should be treated by wide local excision, including an adequate area of skin at least 5 cm. from the edge of the growth, and the underlying deep fascia for at least 10 cm. away from the edge of the growth, followed two weeks later by an ilio-inguinal block dissection of the lymph nodes. The primary growth must not be damaged in any way, nor should it be touched by the scalpel or forceps during the operation. If there is evidence of further invasion adequate resection of the soft tissues involved must be undertaken. In the case of this patient, who had the primary lesion excised eighteen months ago, since there is no local recurrence and the ilio-inguinal lymph nodes are still not palpable, it is probably better not to carry out a block dissection on account of the long interval which has now elapsed. The patient should be seen regularly, and if these lymph nodes become enlarged an ilio-inguinal block dissection must be performed. This case provides a good illustration of the way in which trauma can precipitate malignant changes in a naevus.

Difference in Size of Breasts

Q.—*Is a gross difference in the size of the breasts—apparently congenital—common? Can anything be done either to reduce the larger or increase the smaller breast? This condition in an otherwise healthy and well-built girl of 20 is causing some mental distress.*

A.—A gross difference in the size of the breasts is not common, but when it does occur it may be a source of very considerable embarrassment to the patient. The best form of treatment is surgical reduction of the larger breast to the size of the smaller. This is an operation which should be carried out by a plastic surgeon.

Diet After Cholecystectomy

Q.—*What diet should be advised post-operatively and subsequently in patients undergoing cholecystectomy?*

A.—It is advisable for patients who have undergone cholecystectomy to take a diet which contains only small quantities of cholesterol and fat. The total calorie intake must depend on the need for weight reduction; many of these patients are obese, and therefore a diet of low calorie value is often indicated. It is impossible to set out the diets in detail here, but they will be found, both for the immediate post-operative period and later, in Carter, Greene, and Twiss's *Diagnosis and Management of Diseases of the Biliary Tract* (1939, London, Baillière, Tindall and Cox).

NOTES AND COMMENTS

Urinary Incontinence.—Dr. FRANCIS M. SHATTOCK (London, E.C.1) writes: I was interested to read the question on urinary incontinence which was raised in "Any Questions?" (February 4, p. 318). I have tried using the various methods which were suggested. If a bottle is kept between a patient's thighs it is often split by the patient moving. The penile clamp is uncomfortable if complete continence is maintained, and the use of an absorbent material is often irritating to the patient's thighs. I have found that the best solution to this problem is the method in use in the department of neurosurgery at St. Bartholomew's Hospital. This method consists in the patient applying a wide Paul's tube over the glans and upper part of the shaft of the penis, the tubing being kept in position with a strip of adhesive plaster. The distal end of the tubing is led over the side of the bed into the mouth of a urinal which is suspended from the bed frame. By the use of a suitable length of tubing this method secures not only complete freedom of movement in bed but also enables the patient to be completely dry.

Survival of the Flea.—Mr. LESLIE F. NEWMAN (Holt, Norfolk) writes: I read with interest Mr. G. C. Adeney's comment (February 18, p. 448) on this subject ("Any Questions?" December 24, 1949, p. 1484), as I have on several occasions, while shooting rabbits in the harvest field, found a small area of soil covered with fleas. They will climb on to the ankles of those who wear low shoes and thin socks or stockings, but except for the tickling cause little inconvenience and soon disappear. After the first two occasions I made a detailed examination of the soil and in each case found the hard parts and lots of skin of a rabbit or rat. In a similar way fleas will climb on to the hands of men and boys carrying recently killed wild rabbits, and parasites will usually leave the body of a dead animal as it cools. I think that if a rodent dies in a place where the fleas have little chance of finding another host they will propagate without food and remain in the same spot for some time. If my conclusions are correct they will account perfectly for Mr. Adeney's experience in Lemnos.

Holidays Abroad.—Professor HÖGL (Chief of Foodstuff Control, Swiss Federal Board of Public Health, Berne) writes: We have read the reply entitled "Holidays Abroad" ("Any Questions?" February 11, p. 385), which calls for a few remarks on our part. It seems that travellers are advised to avoid drinking unboiled water in Switzerland, except in the large towns. We would like to state that drinking-water is submitted in our country to a very thorough and extensive control, the only exceptions being a few very remote places located in the mountainous part of Switzerland. As a measure of the safety attained by this control, there were 63 cases of typhoid fever in 1948 and 81 cases in 1949. We have reasons to believe that quite a few of these cases had their origin in an infection caught abroad. We also had 56 cases of dysentery in 1948 and 48 cases in 1949. However, it must be pointed out that these dysentery cases were of the mild type E caused by *S. sonnei*. It is also recommended in your reply that "fresh fruit should also be forbidden unless it can be peeled; oranges and apples, provided they are peeled, can be eaten." We wish to assure your readers that from the point of view of hygiene peeling of fresh fruit is not necessary in our country, a mere rinsing with water being sufficient. A third and last point to which we would like to draw your attention is that ice-cream is and must be made with pasteurized cream, according to the legal prescriptions of our country. The statement that "ice-cream should be forbidden, as it may convey typhoid and paratyphoid as well as undulant fever," is not true for Switzerland. We hope that this information will be of help to your readers, and we also hope that it will prevent any unnecessary fear of travelling to and through Switzerland.

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